Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

Vol. XIX **CHICAGO, SATURDAY, JANUARY 1, 1910** **No. 1**

PUBLISHED EVERY SATURDAY BY THE

Telephony Publishing Company

Monadnock Block, Chicago

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The present publication comprises: The Telephone, Telephone Magazine, Sound Waves, American Telephone Journal and Telephony
Vol. 19 No. 1

TERMS OF SUBSCRIPTION:

United States, Cuba and Mexico.....per year, $3.00
Canada 4.00
Other Foreign Countries within the Postal Union..... 5.00

NOTICE TO ADVERTISERS

Changes of advertising copy should reach this office ten days in advance of date of issue. New advertisements accepted up to noon of Tuesday for the paper dated Saturday of the same week.

Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill,, under act of March 3, 1879.

CHICAGO, ILL., SATURDAY, JANUARY 1, 1910.

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The New Year.

This week's issue of TELEPHONY appears on the first day of the New Year, 1910.

To each one of its readers, TELEPHONY extends a hearty greeting, and best wishes that the New Year will be full of joy and prosperity. More or less of care, hard work and discouragement inevitably await everybody in 1910, but with stout hearts and a faith that he who does his best will not fail in the real sense of the word, all can face the coming year with confidence and hope.

The signs are multiplying that good times are fast returning to the whole country, and that the telephone industry will share in this business revival is beyond all doubt. Independent telephone men can meet the new year with a strong, more abiding confidence in their industry than they have ever possessed before—and, that, be it said, means much, for Independent telephone men have always been blessed with a sturdy hope and faith in their business. That is why the Bell monopoly has found it impossible to crush them even with methods that would have annihilated any other industry.

On the threshhold of the New Year, it is interesting to find President Vail, of the Bell corporation, saying: "We recognize that in many sections of the country the public are still in favor of a dual telephone system. So long as the public demands such service it is bound to have it."

At last the Bell "recognizes" something that does not bear the blue sign of monopoly!

The New Year certainly promises new things. TELEPHONY hopes that 1910 will bring happiness and success to all its friends.

The Morgan Entry.

More good advertising has been received by the Independent telephone industry from the entry of J. P. Morgan & Company in its midst than from anything which has happened in years. For, whatever there may still remain of mystery about the Morgan deal, one thing is sure—it is that anything with which Morgan is connected gets big space in the papers throughout the country. During the past week or so things have developed which have set the pessimists about the Morgan deal to following new lines of thought, but it can still be said that nothing very definite and conclusive has come before the public.

From the standpoint of the Independent interests in general, the situation may be approached from a great many angles. Today it is not even certain to the average owner of telephone property whether Morgan's becoming a factor in the Independent industry marks his entry into what he considers a field for development, or is a sudden stride into the middle of the arena to give battle for his old allies. Yet Morgan has the reputation of ever taking the constructive side, and of controlling any situation into which he enters.

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Independents throughout the country who are not intimately involved in these deals will certainly derive a benefit from the advertising Independent securities have had and the prestige they will hereafter unavoidably hold, due to the fact that the heaviest investment projects ever recorded in Independent property have been by the firm of J. P. Morgan & Co.

President Vail Recognizes Public Demand for Competition.

No sooner had these deals taken place than even T. N. Vail was obliged to about face, straighten up in line with public opinion, and say:

"We recognize that in many sections of the country the public are still in favor of a dual telephone system. So long as the public demands such service it is bound to have it."

It took the Bell Telephone Company many years to find out that the people of this country want competition in the telephone business, and usually get what they want. But, now the Bell Telephone Company is there, it will probably stick to the position as persistently as it formerly held to the fallacious policy of monopoly.

Norton "Has Proofs"—So Had Cook.

"Peevish" seems to express the state of mind in which C. S. Norton left the Chicago convention. He went back home, nursed a grouch and worked up a fine come-back for the men who had labored shoulder to shoulder with him in developing the Indiana Telephone Association and strengthening the properties Mr. Brailey sold to Morgan. Norton was bound to get even with them for repudiating him when he went back on the old principles under which the Independents had grown to their present strength. He was anxious to explode, and wanted to touch off the fuse in public. Here follow a letter sent to TELEPHONY, accompanied by a request for its publication, and our reply:

Indianapolis, December 17, 1909.

"Mr. F. H. Reed, Editor TELEPHONY.

"Dear Sir:

"In the interest of truth, I beg to state that your inference in your report of the International Convention in your December 11th issue, that there was a preconcerted scheme on the part of Mr. Brailey, 'the mysterious financial interests' and myself to get the International Convention to advocate competition of a mild form is wholly without foundation. Mr. Brailey knew nothing about the article which I had written for the Bulletin on 'Constructive Competition' nor the letter which I had sent out until after he had arrived in Chicago. It was done wholly as my own initiative, not as president of the State Association, but as an individual, and summarized my convictions after fifteen years of work in the Independent field of Indiana.

"As to the men who supported the resolution. I have positive proof that every man in the Central Union territory who voted to support the resolution was representing a company which, at some time, has had negotiations with the Central Union Telephone Company, looking to the elimination of competition in his respective territory.

"Yours very truly,

"(Signed) CHAS. S. NORTON."

Chicago, December 23, 1909.

"Mr. Chas. S. Norton,
Indianapolis, Ind.

"Dear Sir:

"I have examined with some attention your letter of December 17th, sent to us for publication. Many of the statements contained therein are so widely at variance with statements which have come to me from other quarters, which I believe to be reliable, that I am investigating these matters further on the other side, and would be very much obliged to you if you will submit whatever evidence you can, as you say, 'in the interest of truth,' to confirm the statements you make.

"Regarding the final paragraph, I should be obliged to you particularly, if you will satisfy me as to the 'positive proof'—As to the men who supported the resolution, I have positive proof that every man in the Central Union territory who voted to support the resolution was representing a company, which, at some time, has had negotiations with the Central Union Telephone Company, looking to the elimination of competition in his respective territory.'

"May I ask also, that this matter cover the extent of the negotiations. From the number of men the Central Union has had out on this work, and the persistency with which they have sought Independent officials, you can understand how important it is that you be more specific as to what you mean by 'negotiations.'

"Very truly yours,

"TELEPHONY.

"(Signed) F. H. REED, Editor."

Norton is getting the publicity he wants for his views through the quotation bureau conducted by the merry court jester of the Central Union Telephone Company in the disguise of a market letter. Meanwhile we are waiting for the "proofs." Is this another case for the expert aid to embarrassed explorers furnished by Capt. August Wedel Loose?

When the devil can not tempt a man to give up a good fight any other way, he offers him a "broader field."—*Farm Journal.*

Local Publicity.

The item from a local newspaper, reproduced with abstracts from an interesting letter by Mr. Roy H. Johnson on another page, presents a very fair model of what this kind of publicity should be.

An examination of the item shows that it brings out the following points: That the telephone company is interested in the city's progress; that it conducts a live, hustling business; long distance business is advertised; the cost of construction, as referred to, will meet the eye of somebody who wants to present an uninformed kick against rates; neat appearance of construction appeals to public pride; the item tends to arouse interest in the company's work, and may induce subscribers to visit the central office; dissatisfaction due to interruption in service during plant changes is discounted by advance notice; the directory is cleverly suggested to be a reference book for addresses.

We consider this particular item so skillfully constructed as to set a mark for publicity work in any small exchange, but the idea could be followed out by any manager even if he were unable to guide the pen with so deft a hand.

Hasten Information for 1910 Directory of the Telephone Industry.

The material for the big book TELEPHONY is preparing to show people where the telephone industry stands at the beginning of 1910 is fast being whipped into shape. The number of new companies listed will run up into the thousands, and the changes in the old ones show the progress which has been made since the previous directory was issued. Persons who read this and are not sure that their company or any neighboring companies have reported may get their names in by using the special information blank in the back of this issue, or writing for return postal cards, and thus may be sure that their localities are completely represented. Such action will be appreciated by the publishers.

The book is needed by telephone people—lend a hand and help push it along!

Installations Aboard Imperial Yachts

Alexandra, Queen of England, and Catherine, Empress of Russia, Admirers of the Telephone—Equipment on the Royal Yachts of the Two Nations—Service Furnished the Yachts in Christiana Harbor Through the City Exchange

By Einar Brofos

Few telephone exchanges have ever cut their circuits to a conversation of the Queen of England, or the Empress of Russia. Yet these royal persons are great admirers of the telephone. So, every summer, the Christiana Telephone Co., of Christiana, Norway, is honored by a request to connect its wires to the royal yachts, as they lie at anchor in the harbor.

The occasion is the visit of these royal daughters to their parents, of the reigning family of Norway, who are venerated and admired not only by their own children, but by all Europe. The Queen and the Empress are themselves admirers of the wonderful instrument which abridges time and annihilates space, and are said to use it frequently, while aboard their yachts, for communications with the palace ashore. Then, too, the telephone service is practically a necessity for the attendants, who must be constantly in touch with the shore for the administration of social duties and supervision of the business of the yachts.

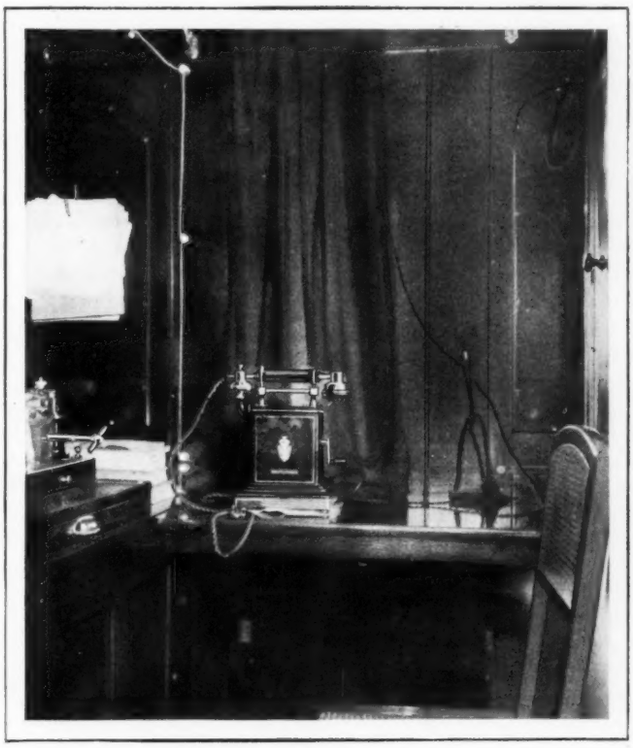


Fig. 1.—Telephone Used by the Empress of Russia, and Officers of the Russian Imperial Yacht.

For connection with the royal yachts, and also for accommodating other visiting ships, the company has provided two specially designed cables, both permanently connected to different points on shore. Through the courtesy of the managing director of the telephone company, the writer obtained some data on this subject, and he also was permitted to visit the royal yachts.

In Fig. 2 is shown a view of the Russian Yacht, "The Polar Star," and the English Yacht, "Victoria and Albert," lying in the harbor of Christiana, while both vessels are in telephonic connection with the city. In order to ensure the yachts obtaining connection directly after their arrival, the harbor department advises the telephone company of the anchoring places of the vessels previous to their arrival. The cables, which are wound on reels, are then rowed out to these anchoring places and as soon as the yachts arrive and have been moored, the cables are attached to the anchor chain. Duplex waterproof wires connect the cable to the telephones on board. Fig. 4 shows the cable boat beside the Russian yacht, ready for attaching the cable, while Fig. 1 is a view of the telephone room on board the same vessel. The telephone which is furnished by the company is a standard Norwegian instrument of the bridging magneto type. As the "Polar Star" is equipped with wireless telegraph, the telephone is installed in the telegraph cabin, the recorder at the left in the picture belonging to the wireless system.

A suitable cable for connecting the vessel with the shore had to be constructed differently from an ordinary submarine cable. In the first place, it had to be light and flexible, in order that it might be laid and taken up as easily as possible; then it was required to be specially supported, due to the fact that it would be in a steady motion during its attachment to the vessel. Finally the ordinary insulation precaution for submarine work had to be taken care of.

A drawing of the cable selected is shown in Fig. 5. It contains two conductors *A-A* and two supporting cords,

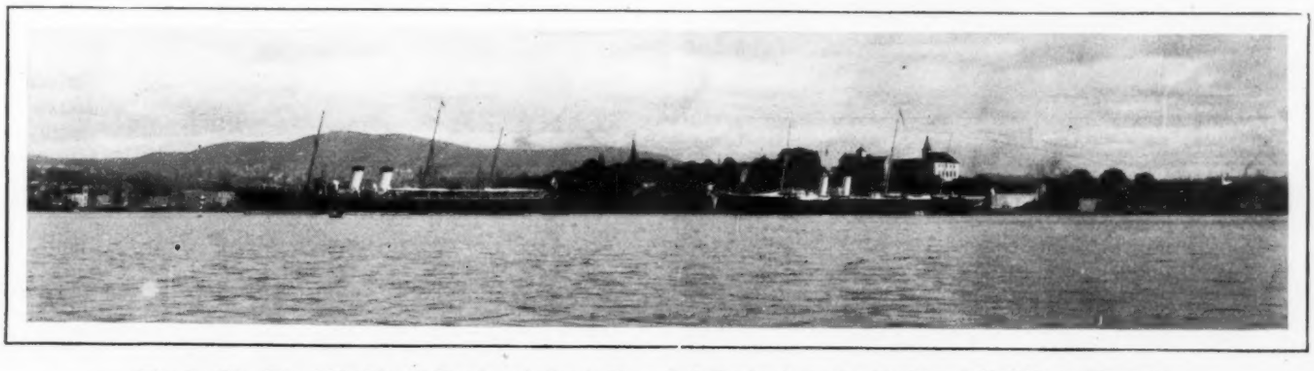


Fig. 2.—The Royal Yachts of Russia, at the Left, and of England, in the Harbor of Christiana, Norway.

B-B twisted together with four jute fillers, *C* to make it round. It is wrapped with rubber friction tape, over which is a stout braid saturated with a water proofing compound. The diameter of the finished cable is 9-16 inch. The two conductors *A-A* are used for transmission purpose; the

Fig. 3.—Taking Up the Cable which Was Laid to the British Royal Yacht in Christiana Harbor.

cord *B-B* for taking up the strain on the cable. Each of the conductors, *A-A*, consists of 16 strands of No. 29 B. & S. gage tinned copper wire, twisted into a four cord flexible rope, insulated with rubber and then wrapped with rubber friction tape. The resistance of the conductor is about 5 ohms per 1,000 feet. The supporting cord *B-B* consists of 12 strands of No. 26 B. & S. gage copper wire, twisted together and protected with a braided covering.

Although the capacity of the cable is somewhat high, conversation is carried on without difficulty, the low resistance of the strand tending to increase the efficiency of the conductor. The cable is made by Felten & Guilleaume Act. Ges., of Germany, and is sold at about 7.5 cents per foot.

This type of cable, which was first made for Emperor Wilhelm's private yacht, is found to be quite suitable for the purpose intended. The Christiana Telephone Company has had two of these cables, each about 2,300 feet long, in service for some time, and little or no trouble has been experienced, even when they have been in salt water for almost a month continually.

The telephone company charges a flat rate of $40 for putting a vessel in the harbor in telephonic connection over this cable, the price remaining the same whether in

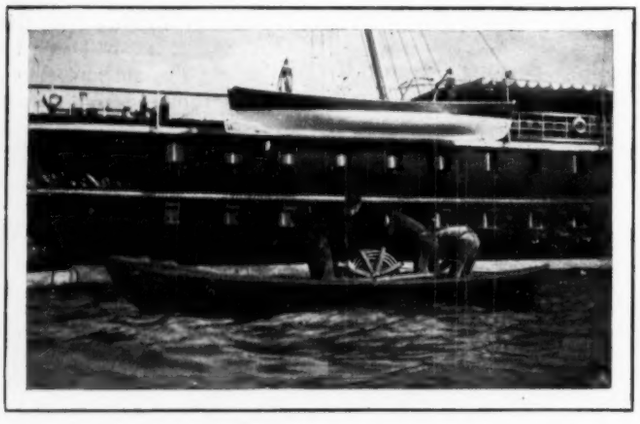


Fig. 4.—The Cable Boat Beside the Russian Imperial Yacht. Cable is Moored to the Anchor Chain when Connected.

use for a day or a month. The service is apparently no money maker, but is provided as an accommodation to visiting yachts and warships.

This use of the telephone aboard ships in Christiana Harbor in many respects resembles the methods of furnishing service to vessels afloat in waters of the United States, where shore service has been given to the yachts in New York Harbor, and on the Pacific Coast to vessels of the United States Fleet.

Manager in New Mexico Alive to the Value of Newspaper Space.

The Grant County Telephone Company of Silver City, New Mexico, of which Mr. Roy H. Johnson is manager, has adopted what may be considered a good plan for keeping prominently before the telephone using public. The company, when occasion arises in the shape of new construction or extension, gives the local newspaper an account of what is being done. The idea is not so much to furnish a news item, which is of small importance, but to show the public what is being done by the company, and thus keep itself before the patrons. Manager Johnson, in writing TELEPHONY concerning his plan, states that almost any small company can do the same, as the editors of most country newspapers are glad to publish articles which are of interest to the reading public. The article makes the telephone subscriber feel that the company is doing its utmost for him, and giving good value for the money spent for service. The following is abstracted from the article which appeared in the *Silver City Enterprise* of December 3rd.

"That the Grant County Telephone Company is not slow to see that the advancement of Silver City and Grant County is to its own immediate interests is shown by the fact that it is always in the vanguard of those who are doing their utmost to hasten for this section the measure of prosperity which is its ultimate due.

"Through its efforts long distance service to Deming and

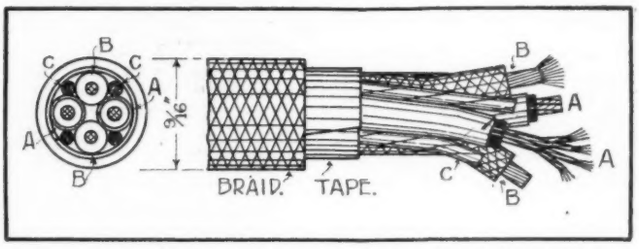


Fig. 5.—Drawings of the Flexible Submarine Cable Used at Christiana.

El Paso was brought about, also the connection with the Mogollon district.

"Within the past six months besides acquiring its own home property for the central office location, it has spent close to five thousand dollars for the improvement of the local service.

"This consists in the purchase and erection of a large amount of aerial cable.

"Besides the immediate cost of the cable, which was over 55 cents per foot for the largest size, the company decided that it would at this time be worth while to put in the handsomest and most durable poles obtainable. For this purpose 35-foot Michigan cedar poles, with 6-inch tops were used. Before setting, these poles were painted white and the butts treated with a preservative compound.

"Although one section of the cable weighed three tons, the work of hanging the cable occupied but four or five days.

"The greater part of the work was in getting ready for it, setting new poles, transferring wires and putting up the suspension wire for the cable, all without undue interruption of the service of subscribers. A large amount of work yet remains to be done in the connection of telephones through the cable. Each of the 408 wires of the 200 pair cable has to be identified and tested before being put in service. The difficulty of this task may be appreciated by seeing a section of this cable at the Enterprise office, scarcely an inch and three-quarters in diameter.

"Terminals for access to the conductors of the cable are to be placed at the street corners and all old poles, cross-arms and wires along the route will be taken down except the few necessary for local distribution between the terminals.

"This will greatly improve the more important residential

streets from an aesthetic point of view, and reduce the chances of crosses with other lines to a minimum.

"The company is now having a local directory printed, which, among other features, gives the street address of each subscriber. It is hoped by this means to add to the value of the book and popularize the system of street nomenclature and house numbering as recently adopted by the city council."

What An Employee Can Do for the Company and Himself.

"The telephone business cannot stand still, it must either go ahead or go back. If it goes backward, it means that your opportunities for increase in wages and advancement are diminishing, while if it prospers and goes ahead, you go with it, and the possibilities are practically unlimited," says President E. D. Nims, of the Pioneer Telephone & Telegraph Company, in a recent number of its monthly bulletin. "Some will ask—how can we help? I believe that it is possible for every employee to save the company from fifty cents to one dollar every day. Suppose each of the 1,200 employees could save the company fifty cents on expenses each day; this would be $600 per day, or $219,000 in a year.

"There are many ways in which you can save fifty cents a day. If, by giving a little better attention and assistance to each other, the operators could better the service and iincrease the efficiency to a higher standard, they would have thereby done their part in keeping the expenses to a minimum. Every lineman (or man handling material) can save his 50 cents or more, by watching the property of the company carefully, saving old material, making repairs promptly, etc. That not only saves the property, but often saves the loss of revenue on account of lines out of order.

"One thing that every employee can assist in is looking out for dangerous conditions. The cost of defending damage suits is growing at an alarming rate. It is the duty of every employee to look out for and to report promptly to his or her superior, any condition that could be considered at all dangerous, or liable to become dangerous; also to take such steps as are necessary to correct or prevent such conditions. Toll operators who save calls that might otherwise be lost, or by courteous treatment encourage new business, can easily save or increase the business many times their fifty cents a day. If each one of you will keep a memorandum for a week, of the savings that you can make in this way, you will be surprised at the amount it will foot up to, and this memorandum, handed to your chief, would be the best recommendation you could have for advancement or increase in wages. You will note from the report that, while we made the handsome gain of 17,717 stations during the past year, we also lost 13,368. The cost of installing and taking out these 13,368 stations is something enormous. If one-half of these lost stations could be saved it would be a handsome gain in our net revenue, and in this and in other ways the employee could save his fifty cents or more per day.

"One of the most important things confronting us today is the education of the public relative to the telephone business. There is no public service business so little understood. A great many people seem to thing that practically all the money collected is profit and they would look at it very differently if it was only understood. The public, as a rule, is perfectly willing that any business should produce a reasonable profit for the investors. The trouble is and has been, that they know but little about it. If each employee would educate one person each day, in a very short time our troubles along this line would be a thing of the past, and you would profit by making it possible for the company to pay better wages, when the public understands and appreciates and is willing to pay a reasonable price for the service it is receiving."

A Christmas Card.

At this season of the year many cards of greeting and good cheer are sent out by firms and individuals. Some of them contain exceptionally good advice and the one reproduced below is worthy of a place on every man's desk. This card "To Yourself" is a message from Gansey R. Johnston, general manager of the Columbus Citizens Telephone Company, to the employes of that company and his many friends. It should be taken as a personal message to each and every reader of TELEPHONY.

To Yourself

THERE are things that you can do
Best yourself;
Things that must be done for you
By yourself.
Pain and sorrow you must bear,
Words and actions you must dare—
Just yourself.

Many a lesson you need learn
For yourself.
Love and honor you must earn
For yourself.
Money, knowledge, friends, and health—
These and more have all their wealth
In yourself.

Watch your doings hour by hour—
Know yourself.
When you've found your range of power,
Trust yourself.
If achievement you desire,
If good habits you'd acquire,
Task yourself.

When you think the whole world's wrong,
It's yourself.
Change your grumbling into song—
Right yourself.
When you say you're down in luck,
Perhaps it's just your lack of pluck—
Brace yourself.

Hold your neighbor in your heart
With yourself.
When he needs you, take his part—
Lend yourself.
Lift the burden others bear;
Let their welfare be your care—
Share yourself.

Christmas, 1909 *Gansey R. Johnston*

An Example of Independent Publicity from Utica, N. Y.

In the November 29 issue of the Utica, N. Y., *Press* appears a large advertisement of the Bell telephone company. Its predominant sentiment is to the effect that if one uses the Bell telephone all his worldly troubles will cease. It so happens that the other side of the question is very aptly presented in an article showing the plans under way to prevent the Bell company from acquiring a monopoly in the business, which appears immediately below the advertisement.

Northwestern Cedarmen to Meet at Chicago, Jan. 11 and 12.

Members of the Northwestern Cedarmen's Association will meet for their annual convention in Chicago, Jan. 11 and 12, 1910. Producers of nearly all the white cedar poles furnished wire using companies will be present. The officers of the association are: President, Ernest L. Clark, Chicago; secretary, H. H. McKinney, Minneapolis.

Long-Distance Tests of a New Transmitter

By Carl Egnér and J. G. Holmstrom

After long experimenting the writers have succeeded in constructing a transmitter which, as regards power of action, surpasses, in our opinion, all transmitters hitherto used. Besides, it can be used for strong currents without undergoing any change. In consequence of our applying for the patents, we cannot yet publish a description of the construction of this apparatus. The only thing we can say is that it is fed by a current of about one ampere. This current can be taken either from a lighting circuit, or from storage batteries, or from a galvanic battery of Leclanché or dry cells. During the last half-year several experiments and measurements have been made for trying the strength of our transmitter in comparison with those hitherto used. Besides, several official trials have been made for fixing the practical value of the instrument on very much longer lines. We give here a summarized description of a number of these experiments and trials.

TRIALS ON THE LABORATORY.

a. Measuring the energy of the alternating current produced by the transmitter.—For this purpose a resistance of 1,000 ohms without inductance or capacity was switched in. We measured the strength of the alternating current in this circuit, a constant sound of middle pitch affecting the diaphragm. This sound was produced by a siren placed in the center of the room. The strength of the alternating current was measured by means of a vacuum-thermocell exactly calibrated with direct current.

The number of watts according with the vibrations of the sound produced by the microphone were for some of the best transmitters now in use, and for our transmitter, as follows:

Kind of transmitter.	A. C. strength. Amperes.	E. M. F. Volts.	Energy. Watts.
Transmitter No. 1	5.5 10^{-3}	5.5	0.03
Transmitter No. 2	8.3 10^{-3}	8.3	0.07
Our transmitter	3.0 10^{-3}	3.0	1.09

b. Trial on artificial cable.—An artificial cable consisting of resistances and condensers connected according to the sketch

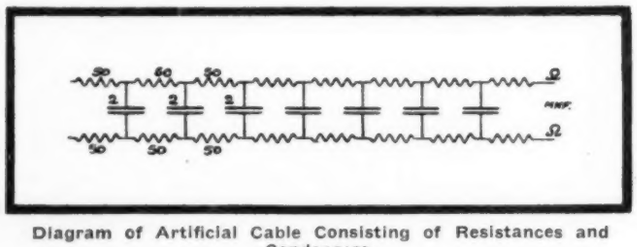


Diagram of Artificial Cable Consisting of Resistances and Condensers.

was used for comparing the strength of several transmitters. The length of the cable was increased until the limit of possibility for a conversation was reached.

The result was as follows:

It appeared that the limit for the transmitter of the Swedish Telegraph Office, as well as of the German Post Office and for the Berliner transmitter, was immediately below or within the resistance of 1,000 ohms and 20 microfarads switched in, whereas with our transmitter speech was still perfect at 1,500 ohms and 30 microfarads.

Calculating the damping coefficient after the form

$$\beta = \sqrt{\frac{\omega C R}{2}}$$

and $\omega = 2 \pi n$, and supposing the average value of the frequency, n, to be 800, the result will be:

For 1,000 ohms and 20 m.f. $\beta = 7$
For 1,500 ohms and 30 m.f. $\beta = 11$

These values are to be understood only for cables; for aerial wires such high values of the damping coefficient cannot be reached, as results of the following trials show.

TRIALS ON TELEPHONE WIRES IN SWEDEN SWITCHED TOGETHER ROUND THE COUNTRY.

These trials were taken by the manager of the Swedish Telegraph Material Testing Station, Dr. H. Pleijel, on the order of the Telegraph Administration.

We specify here some results:

(*a*) *Copper wires 4.5 mm. switched together in circuits as follows*:

Lines.	Kind of Wire.	Distance.
Stockholm-Gothenburg	4.5 Copper	460 kms.
Gothenburg-Sundscall	4.5 Copper	836 kms.
Sundsvall-Stockholm	4.5 Copper	581 kms.
Stockholm-Helsingborg	4.5 Copper	625 kms.
Helsingborg-Malmö	3.0 Copper	68 kms.
Malmö-Stockholm	4.5 Copper	619 kms.
Total length of circuit		3189 kms.

viz., 3,113 kms. 4.5 mm. copper wire
68 kms. 3.0 mm. copper wire
8 kms. paper cable.

The total damping coefficient for this circuit is, supposing the average number of vibrations to be 800 per second: $\beta = 6.05$.

Our transmitter was installed at a place at Stockholm, and there connecetd to the wire of a subscriber's station. The speech was received at another subscriber's instrument at Stockholm (the Telegraph Material Testing Station). By means of a switch either a State transmitter or the new instrument could be connected to the wire. Speaking alternately at both instruments with the same strength, it proved that speech produced by the high current transmitter was entirely distinct, whereas no sound arrived from the State instrument.

Lines.	Kind of Wire.	Distance.
Stockholm-Gothenburg	4.5 Copper	460 kms.
Gothenburg-Sundsvall	4.5 Copper	836 kms.
Sundsvall-Stockholm	4.5 Copper	581 kms.
Total length of line		1877 kms.

of which 6 kms. was in paper cable. Damping coefficient $\beta = 3.65$. The sound of our new transmitter was received very strongly. The sound of the State instrument, as received, could hardly be understood.

(*b*) *Copper wires of both 4.5 mm. and 3 mm. switched together in circuits*:

Lines.	Kind of Wire.	Distance.
Stockholm-Luleå	4.5 Copper	1244 kms.
Luleå-Sundsvall	3.0 Copper	867 kms.
Sundsvall-Gothenburg	4.5 Cupper	836 kms.
Gothenburg-Stockholm	3.0 Copper	460 kms.
Total length of circuit		3407 kms.

viz., 2,077 kms. 4.5 mm. copper wire
1,324 kms. 3.0 mm. copper wire
6 kms. paper cable.

Supposing n to be 800 the total damping coefficient of this circuit will be: $\beta = 8.0$.

In trials taken in this way the speech produced by the high current transmitter was entirely distinct, whereas nothing could be heard from the other transmitter.

(*c*) *Copper wires of only 3.0 mm. switched together in circuits*:

Lines.	Kind of Wire.	Distance.
Stockholm-Sundsvall	3.0 Copper	581 kms.
Sundsvall-Gothenburg	3.0 Copper	771 kms.
Gothenburg-Malmö	3.0 Copper	387 kms.
Malmö-Stockholm	3.0 Copper	460 kms.
Total length of circuit		2199 kms.

viz., 2,103 kms. 3.0 mm. copper wire, 6 kms. paper cable.

Supposing n to be 800 the damping coefficient will be: $\beta = 7.3$.

The conversation could be understood at our transmitter,

whereas no sound was received from the other instrument.

(*d*) *Iron wires of 3.0 mm. switched together in circuits*:

Lines.	Kind of Wire.	Distance.
Stockholm-Södertelje	3.0 Iron	38 kms.
Södertelje-Stockholm	3.0 Iron	38 kms.
Stockholm-Sala	3.0 Iron	131 kms.
Sala-Enköping	3.0 Iron	57 kms.
Enköping-Stockholm	3.0 Iron	76 kms.
Total length of circuit		340 kms.

viz., 320 kms. 3 mm. iron wire, 20 kms. paper cable.

Supposing n to be 800 the total damping coefficient will be: $\beta = 6.3$.

The sound from the high current transmitter was received very strongly and distinctly, whereas nothing could be heard from the other transmitter.

It appeared from those trials made by connecting several kinds of wires together, that our transmitter makes possible a telephone communication over aerial wire with a total damping coefficient up to 8.0, n being 800.

Commercial telephoning proved to be possible on a wire with a total damping coefficient up to 6 or 7.

These trials showed, also, that the limit for commercial telephoning with the Telegraph Office's type of transmitter, and generally taken with all transmitters of the type generally in use, was reached when the total damping coefficient mounted to 3 or 4, as has been generally supposed until now.

By these damping coefficients, and with the aid of the following table, the distance can be calculated on which commercial telephoning will be possible on wires of different kinds, either when using the ordinary transmitter or when using our instrument:

Kind of wire.	Damping, Ordinary telephone.	Our telephone coefficient.	
Copper 3.0 mm	1000 km.	2000 km.	2500 km.
Copper 4.5 mm	1900 km.	3800 km.	4400 km.
Iron 3.0 mm	200 km.	400 km.	500 km.
Iron 4.0 mm	300 km.	600 km.	700 km.

When increasing the distance it must be observed that the strength of the talking current should be increased much more than the sound stifling coefficient. Supposing, for instance, the strength of the current necessary for a wire with a damping coefficient of 4 to be a, the strength of a current for a wire with a damping coefficient of 7 will have to be about 20 a, if the sound has to be received at the same strength.

LONG DISTANCE TELEPHONING ON INTERNATIONAL TELEPHONE WIRES.

(*a*) *Attempts to telephone from Stockholm to Berlin.*

On May 30 and 31 and June 1 and 2, 1909, attempts were made to telephone between Berlin and Stockholm by means of our instruments. The result of these trials was excellent. The sound received at Stockholm was declared to be of about the same strength as in ordinary telephoning from Stockholm to Norrköping, a distance of about 180 kms. For these first trials currents several times stronger than necessary for the purpose were used, which caused strong cross-talk on other telephone wires.

These trials were made with the assistance and the control of the German Post Administration and the Swedish and Danish Telegraph Administrations.

The instruments were during these trials connected as ordinary subscribers' telephones at Berlin as well as at Stockholm.

The telephone wire from Berlin was 5.0 mm. copper and went via Fehmarn, followed the German-Danish sea cable and continued via Copenhagen and Helsingör-Helsingborg to Stockholm. In Sweden 4.5 mm. copper wire was used.

The total length of the circuit was about 1,290 kms., viz.: 578 kms. 5 mm. copper wire, 669 kms. 4.5 mm. copper wire, 43 kms. earth and sea cable.

It appears that as far as the total length of the telephone connection between Stockholm and Berlin is concerned, it was not too long to use even ordinary transmitters, but the large number of either earth or sea cables used in this connection renders this impossible.

ATTEMPTS TO TELEPHONE FROM STOCKHOLM TO COLOGNE.

On June 5 and 6, 1909, telephone communication between Stockholm and Cologne was tried with the assistance and under the control of the German Post Administration and the Danish and Swedish Telegraph Administrations.

The results of these trials were also excellent. In Germany a 4.5 mm. copper wire via Hamburg was used. The German-Danish sea cable was followed and the connection continued via Copenhagen and Helsingör-Helsingborg and further on by means of a 4.5 mm. copper wire to Stockholm.

The total length of this circuit was about 1,512 kms., viz.: 1,101 kms. 4.5 mm. copper wire, 363 kms. 4.0 mm. copper wire, 48 kms. earth and sea cable.

At these trials a rheostat (without induction) was connected to the utter contacts of the Stockholm apparatus as a shunt. The resistance of this rheostat could be reduced even to 100 ohms without the possibility of communication ceasing.

The strength of the sound received at Cologne was fully sufficient for commercial telephoning even with a shunt of only 150 ohms on the Stockholm apparatus.

It can be assumed that a long overhead line of 4.5 mm. for the starting talking current represents a resistance of 700 to 800 ohms. Of these experiments appears that the new microphone was several times stronger than it is necessary for the telephone communication between Stockholm and Cologne.

TELEPHONING FROM STOCKHOLM TO PARIS.

On June 11 and 12, 1909, trials were made of telephonic communication between Stockholm and Paris with the assistance of the French, German, Danish and Swedish Telegraph Administrations. Even over this distance very good telephone communication resulted.

Among those who, on this occasion tried the telephone connection, was Mme. Allizé, who spoke from Paris with her husband, the French ambassador at Stockholm. The articulation of the woman's voice was received excellently.

The circuit, principally 5 mm. copper wire in the Continental lines, went from Paris to Frankfort-on-the-Main, and further on via Hamburg and the German-Danish cable to Denmark and via Copenhagen, Helsingör-Helsingborg to Stockholm. In Denmark and Sweden a 4.5 mm. copper wire was used.

The total length of the Paris-Stockholm circuit was 2,270 kms., viz.: 1,190 kms. 5.0 mm. copper wire, 669 kms. 4.5 mm. copper wire, 363 kms. 4.0 mm. copper wire, 48 kms. earth and sea cable.

In addition to the trials over this circuit, a wire from Stockholm to Sundsvall, length 583 kms., was switched in, to give a further extension. It proved that the Paris conversation could be understood very well at Sundsvall, so that the possibility of a telephone communication from Paris to Sundsvall was stated.

In all these experiments the new strong current transmitters worked with a feeding current of about one ampere. However, they can also work while passing a much higher current, if this should be desirable in a special case. But one ampere proved to be sufficient even for the longest distances.

During the experiment of telephoning from Stockholm to Paris no shunting trials were made in consequence of the short time during which the connection was at the disposal of the experimenters. Judging by the strength of the sound at this distance, it should be possible to considerably decrease the strength of the talking current without causing the intelligibility of the communication to become too far reduced.

Especially at the trial on the Berlin-Stockholm circuit a strong transmission of the speech to the neighboring wires, or "cross-talk," could be observed. The cross-talk was stronger on the German wires than on the Danish and Swedish circuits. This is caused by the type of construction; the former wires are transposed in the cross-arms, making a shift of positions only in the horizontal plane, as in America, with proportionally

long distances between the transpositions, whereas the latter are spirally transposed, so that each wire revolves around others, as in a cable.

Trials taken afterwards by the Telegraph Administration on interurban circuits in Sweden have proven that even the strong current transmitter working with the entire current strength on the wire, occasioned no perceptible cross-talk on wires without faults. Ground escapes, however, cause noise to appear, but this will not disturb communication unless the wire is in bad condition.

According to the arrangement described in connection with the tests of communication between Stockholm and Cologne, a shunt can be switched in, absorbing a small or a large part of the current. In this way the strength of the initial talking current can be regulated at will. Probably these instruments will be provided with such a shunting arrangement when brought on the market, so that no stronger current need be used than necessary for the distance in question. By means of this arrangement it is possible to employ these instruments without difficulty also on horizontally transposed wires.

TESTS FOR WIRELESS TELEPHONING.

On several occasions the writers have tested the new transmitters for wireless telephoning. For this purpose there have been constructed special models, capable of passing a permanent current of 10 to 15 amperes.

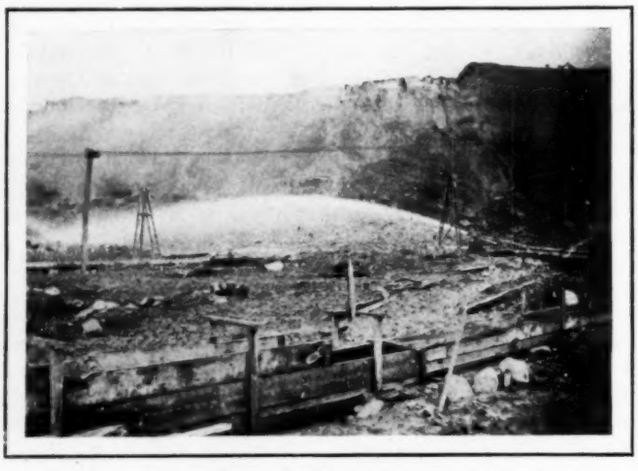
Especially have these transmitters been tested at the laboratory of the Danish engineer, Valdemar Poulsen, who has, as is well known, invented an effective arrangement to produce undamped electric oscillations for wireless telegraphing and telephoning.

The last test was to telephone between the Poulsen wireless stations at Lyngby and Esbjerg, in Denmark, on June 29 and 30, 1909. Our new strong current transmitter was used at the starting station at Lyngby. It proved that the sounds were very well understood by the observers stationed at the Esbjerg station.

The distance between these stations is about 280 kms. Through the transmitter at Lyngby a high frequency current of about 6 amperes was sent.

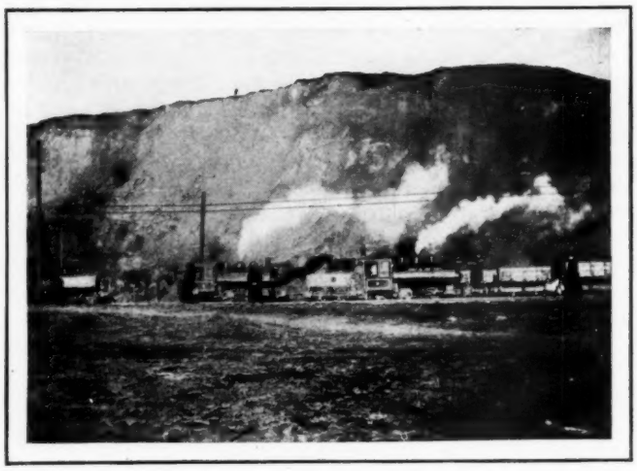
Difficulties Which Are Being Surmounted by Telephone Engineers at Seattle.

Ordinarily a telephone company can figure its underground subway system as being to a large degree a permanent structure.



Taking Away the Hills in Seattle. Telephone System Had to Be Reconstructed After Grading Was Completed and Buildings Erected.

Accompanying photographs, however, which are reproduced through the courtesy of Mr. C. H. Judson, show the most remarkable exception to this rule which has perhaps ever been recorded in the history of the telephone business. In the first place, they indicate the extraordinary topographical conditions which are in evidence in the city where they were taken, Seattle, Washington. The large areas appearing in the foreground of the photographs show excavations in the place of hillsides



Another Hill Being Removed, Necessitating the Reconstruction of Part of the Telephone System.

which were formerly covered with houses. The view in which the sluicing outfit is visible shows a locality where the original ground was very densely populated. Every house in the entire district was moved away before the earthwork began. This particular picture was taken last winter, and at the present time the flat ground is covered with brick and substantial frame buildings; sidewalks and streets are in; street railway tracks are laid, and everything has resumed the aspect of a busy downtown district.

The problem which this puts up to the telephone engineer and manager is left to the imagination of the readers. It is sad enough that the men on the ground have had to figure out and get a practical solution for a proposition containing such annoying features, without forcing outsiders to come to a definite and detailed appreciation of the amount of work and perplexity which such conditions may well be assumed to inflict upon telephone men.

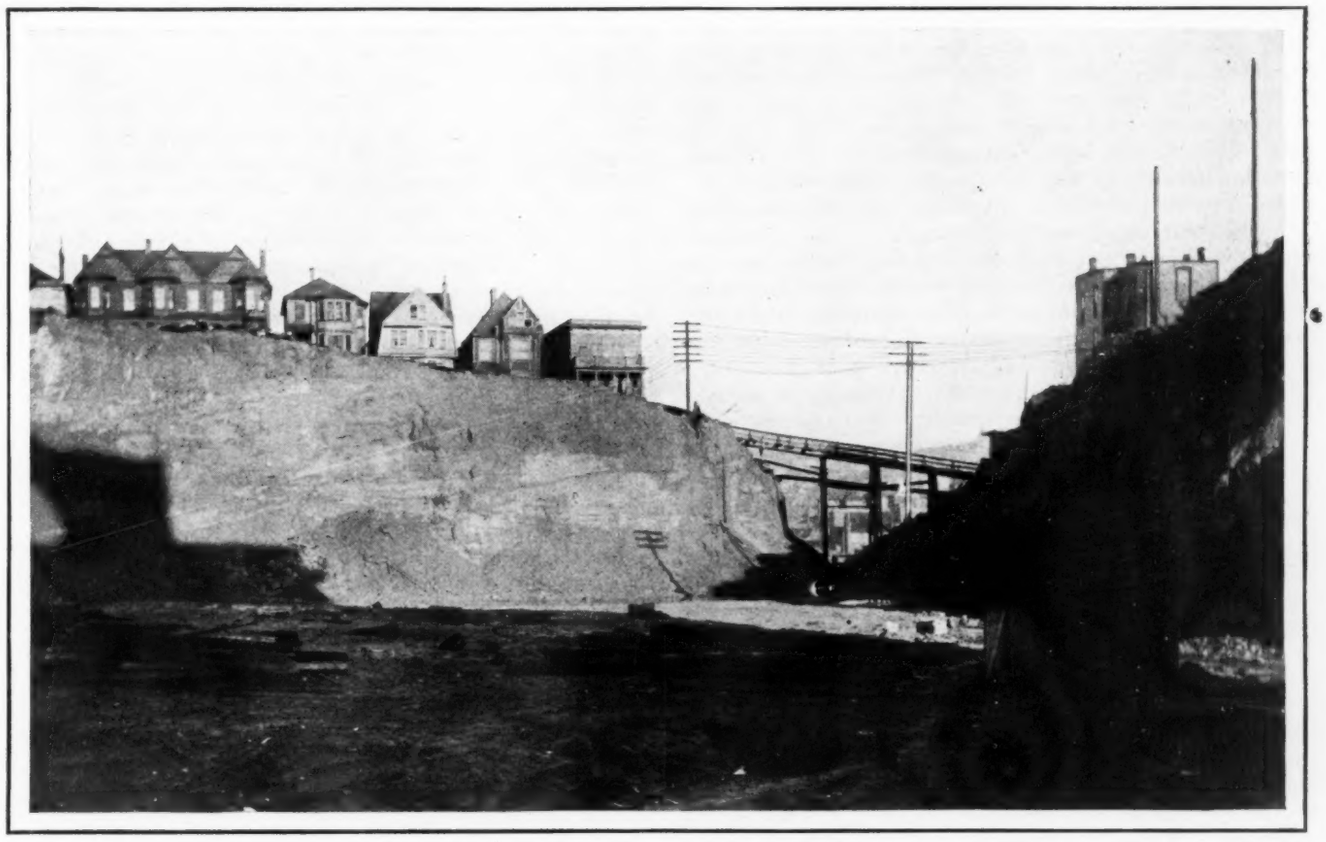
Investigation of Electrolysis at Winnipeg.

Serious damage to telephone cable sheaths and other subterranean conductors in Winnipeg, Manitoba, was found to have been caused principally by remediable faults in the lay-out and physical condition of the electric railway system. The subject is treated at some length in a report made by Prof. Louis A. Herdt, of McGill University, who investigated conditions under authorization of the city.

A simple discussion of the causes of electrolysis, included in this report sets forth that:

"Currents from the railway system, if the track returns are in bad condition, having to find their way back to the power house, will flow from the rails which are in contact with the ground, through the ground and such metallic constructions in it as offer the least resistance to the flow, and after flowing through these (gas pipes, water mains, lead-covered cables, etc.) toward the station, will return through the ground, back to the rails to return conductors in the vicinity of the power house. These stray currents cause electrolytic action. That is, wherever current passes from a pipe or cable to ground, or to another pipe or cable, corrosion of the metal is set up; holes and pitting, are produced, causing bursting and leaking of pipes, eating away of the lead-covering on telephone and other cables rendering them useless. This corrosion may be very rapid, and depends on the intensity of the stray currents passing through.

"If the rails in a track system were continuous and the current density in the rails kept low, with rails well connected to the power house, the rails would offer such a good return path for the current that street piping, cables and other metallic structures would be practically immune from electrolytic damage due to stray currents. However, as the rails are not continuous but made up in lengths, they must be jointed by copper bonds possessing such mechanical and electrical properties as will secure permanent and efficient electrical continuity of the rails between sections. If such bonding does not exist, and if return feeders connecting the rails to the power house are inadequate for the purpose, the amount of leakage current must be great and electrolysis is bound to exist. The immunity of street piping and other metallic structure from electrolytic damage due to stray currents demands that electric railway companies adopt such method of construction for their track returns as will minimize the danger and the railway companies must maintain the efficiency of such construction through systematic inspection and repair."



This View Shows Not Only the Character of Regrading Operations in Seattle, But the Class of Buildings in the District Which Was an Extensive User of Telephone Service.

In pursuing his investigations Prof. Herdt caused to be made a survey for electrolysis involving readings of potential difference between the rails, the piping systems, and the telephone cables, and an examination of the track, piping and cable systems was made. In arriving at conclusions the existing lay-out of feeders and sections, electric railway tracks, weight of rails, return feeders, condition of roadbed, bonds, etc., were taken into consideration.

It was found that unless a very generous amount of copper in return feeders and efficient track returns were used to carry back to the negative bus bars at the electric railway power house its output, running from 6,000 to 9,000 amperes, conditions especially favorable to electrolysis would exist. Among these were enumerated the location of the power station, its distance from the tracks, the strength of current, the run of piping and cables, and the proximity of a river.

Included in the reports of observations is a statement that in one locality where the electrolysis was particularly severe, the railway company's bond wires, of No. 0 B. & S. soft copper wire, with bonding cap terminal, gave readings, in equivalent feet of rail, of 20 to 60 feet—a very bad condition of bonding.

The means set forth for remedying the trouble, all devolving upon the electric railway company, were as follows:

1. Installation of sub-stations at different points of the system—this with a view of diminishing the amount of current returned through the rails in the city's centre..
2. Proper rebonding of all tracks that show defects.
3. Special bonding and cross bonding at inter-sections.
4. A system of inspection of track returns.

In discussing these recommendations Prof. Herdt wrote: "A sub-station system of power distribution will do away with the electrolytic trouble. At present the whole current for the railway service being fed from one station, gives rise to a concentration of current in the tracks situated in the heart of the city. The current density in the rail returns must be kept low. The soil in this city shows a very low resistance and only very small difference of potential in rail returns can be allowed. This must be assisted by a rebonding of the tracks which show defects, that is, which indicate excessive drop. All bonds showing a reading of more than 4.5, that is, whose resistance is greater than 4.5 feet of rail should receive attention and be made good. Track intersections should also receive careful attention. Ground plates at sides of bridges to carry return currents from one side of river bank to the other must be done away with and insulated feeders placed instead."

The Purchasing Department*

By Floyd N. Dull

The purchasing of supplies for telephone properties has peculiar features not found in any other business. A manufacturer, in computing the price at which he can profitably sell his wares must take into consideration several important things, including the cost of crude material and its quality, the cost of making up the product, etc.

If a certain article costs him $.30 this price is one of the important items entering into the selling price of his product; and if the concern from which he is buying this article advises him that the price has been raised to $.40, he must increase his selling price accordingly. But he does not pay the 33 1-3 per cent increase until his purchasing department has exhausted every effort to secure this article for the $.30 originally paid, or at least considerably less than the $.40 which the one concern advised him he would have to pay.

The telephone business is entirely different. The company goes into the market, purchases the necessary poles, cross-arms, wires, cable, conduits, hardware, etc., and this material is in turn assembled into one great machine and is finally ready for business. Here is where the difference lies. The company then has something to sell, but unlike the manufacturer, it has no tangible product composed of these elements, merely an invisible commodity, though an all important one, namely "Service." It has previously fixed the price of this commodity, and this price cannot be changed or modified to meet the various slight fluctuations which take place in the cost of the materials which it is using. The telephone man, having first, of necessity, fixed a price which will in a measure cover these fluctuations, is not compelled in a strict sense to pay as close attention to cost prices as the manufacturer, who depends solely upon material costs, and is therefore prone to neglect this all important duty in the stress of other matters and in his earnest desire to push his institution ahead another notch. Today he builds a line in the construction of which he uses poles that cost $4 and cross-arms that cost $.38 each; next week he builds a similar line, but his poles cost $4.20, his cross-arms $.45 each, an increase of $.20 in the price of one and $.07 in the price of the other. Yet he gets no more for his service.

With an established purchasing department, whose duty it is to devote the necessary time and attention to these details, a great saving can be effected and more consideration can be shown the all important subject of uniformity and standardization of equipment.

The installation and arrangement of a purchasing department is a simple matter, and such a department, owing to the peculiar nature of its workings, can co-operate with all the other departments of the institution to the benefit of all concerned.

A brief outline of the conduct of our department is as follows:

An ordinary requisition form is furnished all departments. Requisitions for general warehouse items, such as poles, cross-arms, hardware, wires, general stationery, conduits, telephone instruments, switchboard parts and appurtenances, etc., are made by the purchasing agent who has charge of the supply department, and whose duty it is to keep the general supply of material in proper shape. Requisitions for special requirements are made by department heads and forwarded to the purchasing agent, who adds his initial, indicating that he has investigated the condition and found the article necessary and then forwards them to those in authority for final approval. They are then returned to the purchasing department, where they remain until a purchase is made, the material received and properly checked and the invoice, with freight deductions, if any, is approved by the purchasing agent. Then the invoice is forwarded to the auditor for payment, together with the approved requisition showing authority for the purchase. The work of getting new quotations or referring to standard quotations on file is simply a matter of detail, and the more simply this work is conducted the more efficient the service rendered.

The equipment of our purchasing department is as follows:

A letter file of general correspondence, including quotations, duplicate invoices and filled orders; a file of unfilled orders; and, a cost card file.

Purchases made are recorded on these cards, which are arranged alphabetically, one card for each class of material; the record showing the date of purchase and from whom obtained, the purchase order number and the price. Detailed information pertaining to specifications, terms of payment, etc., need not be recorded as one can readily turn to the original purchase order in the adjoining file. Any well regulated purchasing department must continually refer to previous purchases, and it is essential that this method of reference be simple and easily accessible.

The duties of a purchasing agent are varied, and he finds it necessary to confer with every other department. Today he is in consultation with the president, relative to the purchase of a new switchboard or an addition to the old one; tomorrow he is arguing with the janitor about the price and merits of a certain broom or scrub brush, while in the interim he may have negotiated the purchase of a varied list, including the poles, cables, etc., for a new line, a certain brand of lubricating oil for the motor-cycles, and a quantity of ice cream and cake for an operators' conference.

The subject of stationery and supplies is an important one and by close application to its details, within a year's time a material saving can be effected. It is well to conduct a regular stationery room, and issue from it only a sufficient amount to supply the various departments for a limited time rather than to permit each department to draw various items of stationery until it has a supply sufficient to run the entire company.

By keeping in close touch with all departments the purchasing agent will often find that a requisition can be blue penciled at his station and a similar article located in some other department, though not in use, can be substituted. This also applies in cases where several warehouses or pole yards are located in one city, or where a company operates in several of the nearby towns, as quite frequently surplus material can be transferred at little cost, thereby preventing the necessity of investing new money in various lines.

Purchasing agents will find it good business to confine purchases to local manufacturers and dealers wherever possible. Being dependent upon local institutions for its patronage, the telephone company should endeavor to distribute its favors accordingly. In this connection the purchasing department can often be utilized as a valuable auxiliary to the contract department.

*Abstract of paper presented at the 1909 convention of the International Independent Telephone Association.

The purchasing department cannot be operated effectively without the co-operation of every other department, and especially that of the construction, maintenance and equipment departments. This should impress upon the purchasing agent the importance of gaining the co-operation and confidence of these interests, for upon them he must rely for his practical and technical information. In this connection, it must be remembered that the cheapest is not always the best. While close attention must necessarily be given to initial costs, yet the labor cost involved in the installation and particularly the future maintenance and up-keep must be seriously considered. To work hand in hand with the various departments is the only possible way of securing good results along these lines.

Economy of Training Operators*

By John P. Boylan

The idea that the proper training of an operator is expensive had its inception when compared with the training of employes in other departments, which training is productive of good return to the company when considering the small apprenticeship wages paid. The prospective lineman serves his time as lineman's helper or groundman. The prospective wireman or installer is employed as installer's helper. The switchboard troubleman of the future receives his experience as switchboard installer's helper, or a wireman is advanced to rackman and to wire chief.

When a student operator is given a receiver and placed beside one of the old hands, with instructions to "look and listen," she watches the flash of the line signal, hears the subscriber's voice and marvels at the rapid movements of the operator amid the maze of tangled cords and flying plugs. At the very outset she is confused and discouraged. She considers it well nigh impossible for her ever to emulate the acuteness of mind or the dexterity in manipulation of the model before her. Consequently after the lunch hour is over the "green" girl is often amongst the missing. She has been scared away, and little wonder. What would be one's opinion of the management of a grammar school where the little beginners, instead of being introduced gradually to their A, B, C's, were taken up to the eighth grade, and told to look and listen while an examination in algebra was taking place?

Not all student operators become discouraged, and after several days of watching and listening these are permitted to answer a call. Here is where the phrase "long suffering public" could be aptly applied, for from this period on the operator becomes experienced at the expense of the subscribers.

I am not referring altogether to the smaller companies in this matter. A few weeks ago, while calling over a telephone in a city of over 400,000 population, I was answered by a student operator, who, judging from the sound of her voice, was badly frightened. She repeated my number incorrectly, and I could plainly hear another operator prompting her. There was such a delay as to warrant the regular operator in interfering to complete the connection. In these days of progressive business management, what is the subscriber to think of a telephone company which permits such a state of affairs to exist? No manager ought to permit a student to serve a subscriber before she is capable of properly handling a call.

If the employment of so-called "experienced operators" is attempted in solution of this problem, some very pertinent questions could be proposed, as:

1. How does it happen that the experienced operator is out of a position?
2. Is not your board of a type different from the one the operator worked on; and will it not take time for her to get accustomed to yours?
3. Are the phrases used in your exchange different from those employed by her in the other company?
4. As a result of a policy enforced in the other company, is there not a considerable difference throughout all of the operating rules?
5. On the strength of being an experienced operator, is not the maximum salary demanded?
6. Is it not more simple to teach a student the correct method as you see it than to change the ideas of this experienced operator, and to bring her to your way of thinking?
7. In view of the above, is not the term "experienced operator" questionable, to say the least? Considering everything, would not a "green" girl systematically trained be more desirable?

The Louisville Home Telephone Company maintains an effective and inexpensive school for students. The two end positions are utilized for this purpose. Listening and ringing keys, answering jacks, and lamps, the multiple, etc., are numbered with small paper stickers, and two students at a time are given typewritten papers similarly numbered, setting forth the names of the different pieces of apparatus. A study of this paper covers the first lesson. Two desk telephones are mounted at these positions, both connecting with answering jacks, and with several "dead" numbers in the multiple.

The second typewritten lesson has to do with the coming in of a line signal, the method of answering the call, and the completion of a connection. For practice, one student takes down the receiver of one of the desk sets and the other student answers the call. The calling student asks for one of the numbers given in the lesson. In a similar manner numbers are called in turn by each one to the other, from the directory. Wooden plugs are used for practicing in finding numbers. At the end of each half day the chief operator or a supervisor reviews the work of the students, so that at the end of twelve lessons, or a week's time, the students have practically trained themselves. Some of the larger cities have operator's schools on a more elaborate scale, while some cities have no school at all.

The largest and most complete Independent operating school in the country is conducted by the Detroit Home Telephone Company. With the single exception of the chief operator the present large force of operating room employes, including supervisors, monitors, information clerks and operators, are the product of the school.

In Detroit a school was started for the following reasons:

1. The efficiency of a student after leaving school will be almost equal to that of the so-called experienced operator. Students work up good speed in operating.
2. Experienced operators out of employment, as well as those seeking a change, are, as a rule, undesirable.
3. The other company, on losing a number of operators,

*Abstract of a paper presented at the 1909 convention of the International Independent Telephone Association.

would possibly circulate stories to arouse public sympathy in its favor.

4. Student operators would be paid $20 per month for several months after they entered the company, while experienced operators could not be had for less than $25 or $27, and, in some cases, as high as $30.

It was planned at the outset to open the City exchange with a force of about forty operators. The feature of economy looms up very strongly when one considers that the number of experienced operators at even as low an average as $25 would cost $1,000 per month, as against $800 for the same number of school graduates at $20 per month. This saving in operators' salaries was considered sufficient to pay for the students' switchboard and all accessories in less than a year.

On March 15, three and a half months after the cut-over, there were forty-two operators and sixteen others on the pay roll varying in rank from chief operator to messenger.

The average operator's rate was $20 and the total average, including every employe of the operating department, was $21.77.

The entire cost of the twelve-position students' board, including four teachers' desks, amounted to something like $3,800. This figure was low, due to the fact that only the necessary apparatus required for students' practice was installed, and the balance of the space was painted up to represent in appearance the regular switchboard.

While the complete multiple of 8,000 lines appears in each of the four sections, only one per cent is represented in real multiple jacks, the strips of which are scattered throughout the multiple. The balance is of the dummy type, but the imitation is so cleverly executed that few students have been able to tell the difference between the real and dummy jacks until they have about completed their practice periods.

The students' switchboard is divided into four parts. Each part or section comprises three positions, the circuits of which are connected to a teacher's desk, the idea being to have one teacher in charge of three students.

The course of instruction is divided into twelve lessons, each lesson occupying half a day. Twelve students per week can be turned out of the school, and if necessary this number can be increased to twenty-four a week by conducting evening classes.

The Detroit students' manual deviates somewhat from the methods employed in other operating schools, in that charts are not used, because they are as a rule not understood by the average student. Neither are preliminary lectures given, because such talks necessarily have to do with the apparatus and mode of handling it, with all of which, at this time, the student is unfamiliar. It therefore follows that a lecture would not be comprehensive, and at the best would only tend to confuse the student.

Before taking up the first lesson each student must undergo a test in sight and hearing. This is a very simple affair, the student being required for the test in sight to read certain numbers on monitor plugs, also several multiple jack numbers. For the test in hearing a teacher equips the student with a regular operator's set, and reads fifty numbers from the directory, requiring the student to repeat each number, with the prefix and affix.

The students are then seated at the school board and given their first lesson, which is furnished them in printed form, and comprises rules governing students' conduct while on duty and in the building. This lesson also includes a simple explanation of the switchboard. The organization of the operating room, including the various persons in authority in the department, is also explained.

The second lesson deals entirely with the multiple, and after it has been thoroughly explained to students, the teachers call off various numbers in order for students to practice until they are able to find any number quickly.

In the third and fourth lessons, other features are introduced, and so on. Up to the twelfth lesson, the student is instructed in something new daily, and has no trouble in absorbing and retaining what she has learned. Actual practice in handling calls occupies much of the time after the fourth lesson.

The last half hour of each lesson is given over a review of all previous lessons, including practice.

A teacher, in giving a student a call, inserts a plug in the jack at her desk, and lights an answering lamp at a student's position. The student answers the call in the regular manner, and the teacher, taking the place of a subscriber, calls for a number which is represented in the multiple by a real jack. As soon as the student inserts her calling plug in the jack, it lights a lamp corresponding to the multiple jack on the teacher's desk. The teacher by inserting a plug in the jack under this lamp can put out the supervisory lamp on the student's calling cord, indicating to student that the called subscriber has answered.

The teacher, by means of her cords, has entire control of the supervisory lamps, and can flash either lamp at will. By taking down the pair of cords at the teacher's desk, both supervisory lamps on cords at the student's board will light, giving a disconnect signal.

When the teacher calls for a number in a branch exchange the student, after answering the call, will switch in on the branch exchange order wire, which is connected to the teacher's telephone, the teacher in this case taking the place of the "B" or trunk operator at the branch exchange, and assigning the trunk number. When the calling cord is inserted in the trunk line at the school, a lamp is lighted on the teacher's desk. The teacher can put the "busy back" signal on this trunk, when the student should report to the "subscriber," i. e., teacher, that the line is busy, or the teacher can put out the supervisory lamp on the calling cord, indicating to the student that the branch exchange subscriber has answered.

The teacher can put a busy test or out of order tone on any line on the student's board, and call for this line in order to test the student on these particular features. In a similar manner, every conceivable circumstance or combination which might arise between a subscriber and operator is thoroughly and effectively explained, so that when the student takes her position on the regular switchboard she is never at a loss to know what to do in any emergency.

Cuyahoga's "Mysterious" Owners Want to Raise Rates.

Following the usual practice of the Bell telephone company in places where it regains a monopoly, Brailey's "mysterious syndicate" is planning to raise the Cuyahoga rates in Cleveland. They were cut as a "war measure" some time ago, when Brailey was making his spectacular fight to convince the "mysterious syndicate" that this kind of competition is more expensive than co-operation.

At the directors' meeting where the raise was discussed Brailey was elected vice president of the company to succeed C. Y. McVey, who will, however, continue to act as general manager of the company. H. B. Taylor, treasurer of the United States Telephone Company, was also elected assistant treasurer of the Cuyahoga, creating a new office.

Subscribers Afraid of Thirteen.

When 400 telephones in the series 13,000 were cut over in the automatic exchange at Columbus, Ohio, a short time ago, the company received four complaints against the number 13. Four subscribers believed that the number was unlucky.

A Case of the Unexpected.

The Cumberland Telephone & Telegraph Company is loser by about $10,000 by an unusual incident originating from a very ordinary cause in Nashville, Tenn., recently. A trolley car of the Nashville Railway & Light Company, when returning from its last run at 12:45 the other night, left the track, struck a telephone pole and laid flat just sixty poles with all the thousands of wires they carried.

The illustration shows the scene after more than three hundred workmen had been straightening out the mix-up for twelve hours. Over 5,000 wires were tangled in an inconceivable manner, ten large lead cables broken, railway, light, telephone, signal and other wires heaped into the street en masse.

Damage Done by a Runaway Trolley Car at Nashville, Tenn.

While the accident to the car was a common one in street-car circles, the telephone situation is perhaps the only one of its kind on record. The company was just preparing to put its wires in a conduit, and for this reason had allowed the poles to become overloaded. The poles were also decayed at the ground, and the removal of the one pole brought down every telephone and light pole for eight blocks. Three hundred men were immediately called out by the railway company and the Cumberland company, and for four days they were busy repairing the damage. One-half the city was cut off from the other for twelve hours and no through cars were operated for two days. The two companies have jointly made the repairs, but the engineers have not arrived at the damage to the telephone company. Rough estimates have it that the street railway company will have to pay the Cumberland company something like $15,000 besides standing its own loss.

Where They Have Prepayment Service.

Party—Hello! Give me Parkway eight-six-nine.

Central—Dropanickelplease.

Party—This isn't a nickel 'phone. Let me have——

Central—Dropanickelplease.

Party—What in? I tell you this is a private phone——

Central—Dropanickelplease.

Party—All right, I'll drop one on the floor. Listen! Did you hear it. Now give me Parkway eight-six-nine.

Central—Dropanickelplease.

Party—Hello! Parkway? Is that you, dearie? I wanted to tell you——

Central—Dropanickelplease.

Party—What's the matter, Central? Talking in your sleep? Hello! Parkway? Just wanted to say I——

Central—Dropanickelplease.

Party—Wouldn't be home to dinner. Goo' bye!

Central—Dropanickelplease.

Party—Better take something for that, Central. First thing you know it will get to be a habit.

Central—Dropanickelplease.

Party—Have the last word, if you want to.

Central—Dropanick——*Chicago Tribune.*

Letters from the Readers

New Use for Inductive Cable Tester.

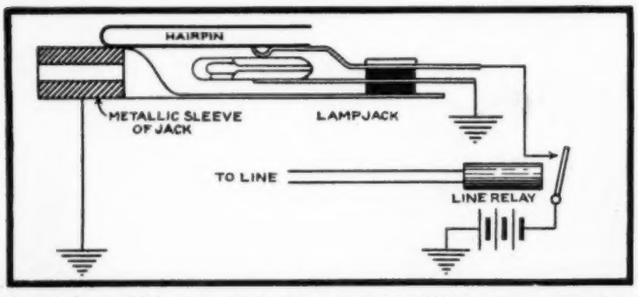
In our exchange of about 5,000 subscribers, the records of cables showing the number of pairs in each, and the ducts occupied, were very incomplete, for the not uncommon cause that several different men had superintended the work and "kept the records in their heads." In order to straighten out the records, we connected the tone producing apparatus of a "wireless" cable tester successively to wires in different blocks at the main frame, and used the detector coil with the attached receiver in the office man-hole, where the cables enter the ducts. In a very short time we had a complete record, such as it would have been hard to obtain in any other way.

Cedar Rapids, Ia. Geo. A. Bishton.

A "Come and Go" P. B. X. Trouble Caused by a Hair Pin.

A case of trouble in one of our private branch exchanges, like a ghost, always disappeared as soon as I was able to look for it.

One day we received a complaint from this particular P. B. X. that the line signal did not come in. It was a ring up,



Location of Hairpin which Caused Intermittent Lamp Trouble.

locking relay system. The line light circuit and location of the trouble are shown in the diagram.

On arriving at the board we had the local exchange operator give us a couple of rings. The signal came in O. K. The relay pulled up finely. But next day, the P. B. X. operator said we had hardly left, on the day before, when she again had the same trouble, and it had happened at various times since.

Asking her how she knew she had a call, she replied that at times she could hear a slight, rattling noise caused by the relay armature vibrating; sometimes, when about to make a call she would find someone on the line waiting, and complaining because she did not answer.

After trying out the line several times and finding it O. K., we adjusted the relay as close as possible, just so it would not stick and stay locked all the time. Although we found the lamp in tight, we changed it anyway. The connections were all looked over and found good. It was a strange case of trouble, or the girl was trying to shift the blame for her negligence.

As the days passed our fears that there was something still wrong gradually died away. Just as we had about reached "easy street," she called in, giving us a red hot complaint. You can imagine how we felt.

We examined all connections, pilot relay, line relay, cut-off relay contacts, wherever we thought there might be trouble, debating whether or not to rewire it, for as usual we found it working in a way that would meet the most rigid service tests. We stayed, watched it, tried it, and left, mystified. We almost believed the operator had not been attending to business.

Shortly afterward we had occasion to remove the answering jack strip above the lamp strip where this particular lamp was located. There lay our "ghost," a hair pin extending back over the lamp spring from the front of the strip. On asking how it got there, the operator said she had put it there! That now she remembered hok, one day when the signal was "permanent," she was playing with the hairpin and the lamp went out. She remembered this and cleared the trouble with the hair pin whenever the light remained permanent, due to the relay staying locked up. Finally she left the pin between the strips, and forgot about it. As the hair pin was jarred about, it would sometimes throw a ground through the frame on to the spring, and shunt the light out.

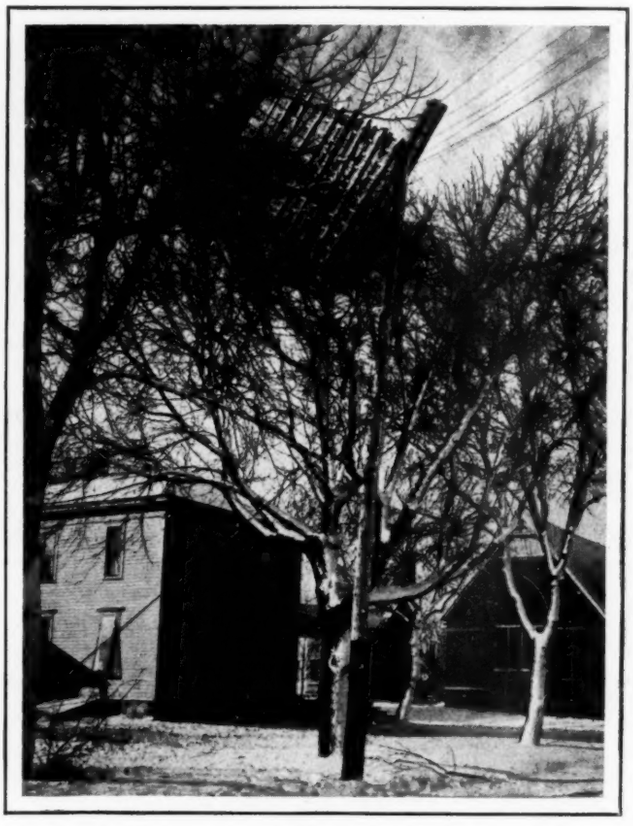
Jay W. Hache.

How a Sleet Storm Break was Repaired.

As the winter season approaches, construction men in the central and northern states are recalling the disastrous storms of the early part of the year, and going over lines to brace up the weak spots.

Among the interesting breaks which occurred last year Mr. H. S. Janes, of Hampton, Iowa, repaired one having several unusual features. The photograph illustrates how a difficult piece of work was accomplished.

"Looking at this pole on the morning of January 29, 1909," says Mr. Janes, "it was hard to tell whether it would be possible to repair it or not. Fifties are not often carried in stock at the small exchanges and this place was



Pole Was Spliced and Break Repaired without Removing Wires from the Ten Arms.

no exception, yet it was necessary to get the lines in service as soon as possible. A thorough inspection of the situation revealed the possibility of making a splice with the pole standing and we immediately set to work.

"This pole is carrying a very heavy load—ten arms with No. 14, No. 12 and No. 10 wire, and one fifty pair cable.

"First it was necessary to do away with one arm, and saw off the ends of the broken parts, making them square so as to come together properly. Then we put on a buck arm, doubled, to use as a support and with guys pulled the top over in a vertical position. Then the two ends lapped about ten or twelve inches, and with the downward strain of the wires and the cable it seemed impossible to get it up in place. But with the aid of a jack screw and blocks nailed on the two parts of the pole we were able to raise the top part up and it slid over in place. We made it fast with four pieces of strap iron 5/16x1¾x4 in., running lengthwise over the splice, and bolted into the two parts of the pole, and it now has the appearance of a new pole only about 10 or 12 inches shorter than it was originally, having broken off almost straight across."

Legal Affairs

By A. H. McMillan

Pole Tax.

An ordinance placing a tax on all poles for electrical purposes has been introduced in our city council. We are therefore desirous of obtaining as much information on the subject as is possible and beg to ask if you will kindly give us recent decisions as well as other infomration you may have.

The question you ask is one which has been very much litigated, the decisions of different jurisdictions being conflicting. Ususually, a pole tax of this character is held to be a license fee. Unless a municipal corporation has been expressly given the power, it has no authority to grant licenses or to collect license fees. Such power must come from direct grant and not from implication. The terms in which a municipality is empowered to grant licenses will determine whether the grant is conferred for the purpose of revenue or whether it is given for regulation merely. 2 Cooley on Taxation, 1133.

Where a license fee is required for regulation only, the amount of it must be reasonable, taking into consideration the cost of inspecting and regulating such poles and wires on the part of the municipal authorities. The decisions upon what is a reasonable license fee are varied, as each case rests upon its own circumstances. The following cases have held that license fees cannot be imposed. Wisconsin Tel. Co. vs. City of Milwaukee, 104 N. W., 1,009; 27 N. W., 828; City of Memphis vs. Postal Teg. Cable Co., 139 Fed., 707. Such taxes have been upheld in the following cases: Atlantic & Pacific Teg. Co. vs. Phiel, 47 Sup. Ct. Rept., 817; Borough of Killanning vs. W. U. Teg. Co., 26 Penn. State, 346; Ogden vs. Crossman, 33 Pac., St. Louis vs. W. U. Teg. Co. 148 U. S., 92; 149 U. S., 465; Borough vs. Delaware & Atlantic Tel. & Teg. Co., Atlantic Rept. (1909); Norfolk & W. Ry. Co. vs. Town of Suffolk, 49 S. E., 658. See also Memphis vs. Postal Teg. & Cable Co., 164 Fed., 601; Schellsburg vs. W. U. Teg. Co., 26 Penn. Superior Ct., 343; Postal Tel. Co. vs. New Hope, Ditt vs. Taylor, W. S. Sup., 5, advances opinions (L. ed.), 205; Mayor of Nashville vs. Cumberland Tel. & Teg. Co., 145 Fed., 607.

A Case of Expired Franchise.

I am interested in a case in this state where a franchise given to a telephone company has expired and on account of failure of telephone company and city council to reach an agreement for the renewal of franchise, the city council has passed an ordinance giving the telephone company thirty days in which to remove poles, wires, etc., from the streets and have ordered the proper authorities to make the removal, in case the telephone company does not act within the limit given them.

I would like to know if the city authorities have a right to take such action and would like to be cited to some similar cases which have been covered by supreme court decision.

Litigation resulted from action taken by the City of Richmond, Va., several years ago, and I think the city was successful in its contention and, if I recall correctly in this case, the City of Richmond actually destroyed the property of the telephone company and I thank you to refer me to the authority which gives all the facts in connection with this particular case, if you are in a position to do so.

The case to which you refer to is the City of Richmond vs. Southern Bell Telephone and Telegraph Co., 174 U. S., 761. In that case the telephone company, which was engaged in interstate commerce, had been given the right to use the streets of the City of Richmond, Virginia, under an ordinance which provided that it might be repealed at any time by the city council, such appeal to take effect two months after the adoption of the repealing resolution. The telephone company had filed an acceptance of the restrictions and obligations of the Post Roads Act with the Postmaster General, as the law required, and when the city attempted to enforce the resolution repealing the company's franchise, the latter sought relief in the courts on the ground that it was entitled by virtue of the Post Roads Act to occupy the streets of Richmond with its lines without the consent, and indeed against the will, of the municipal authorities of that city. The United States Circuit Court of Appeals held the company entitled to avail itself of the provisions of the act of 1866, but this decision was reversed by the supreme court. The decision decreed that the telephone, which is described as "an instruments for electrically transmitting or reciving articulate speech," not having been in existence in 1866, when the act was passed, Congress could have meant, in speaking of telegraph companies, only such companies as employed the means then used for the purpose of transmitting messages merely by sounds of instruments or by signs or writings. The company's charter described it as a telephone and telegraph company, but this was held by the court to make no difference, as the telephone business was the "one in which the company was actually engaged."

As to passing upon your case, we are scarcely in position to do so, not having before us the charter of your city, which might govern the case. The laws of the state give telephone companies the right to construct, maintain and operate their lines with the approval of county or municipal authorities in charge (Laws of 1905-76). This being the law, it would seem advisable for you to comply with the scriptural admonition, "Agree with thine adversary quickly."

When Does Tacoma Franchise Expire?

At Tacoma, Washington, Federal Judge Donworth has denied the application of the Pacific Telephone and Telegraph Company, asking that the city be enjoined from interfering with the company's poles or wiring, or from bringing any action in the state court pending a decision of the bill in equity recently filed by the telephone company. The case will decide whether the public service corporation's franchise expired last summer or extends until 1915, as it is claimed by the company. The denial was given without prejudice to the bringing of another and similar action by the telephone company whenever it deems necessary. It was given only after the city attorney stated to the court that the city contemplated no action either to prevent the company from conducting its business in the city or the filing of a suit in the state court until the present case is settled.

Disposition of Exchange Restrained.

The Valley Home Telephone Company, of Saginaw, Michigan, has secured a temporary injunction restraining George M. Deady, A. E. Sleeper and the Consolidated Telephone Company from disposing of the telephone plant of Deady in Bad

Axe, Michigan. Deady's exchange has been operated in connection with the Valley Home Company's plant for eight years. The contract between the two companies provides that both companies shall be so operated that service may be given from all lines of each party over the lines of the other, and each company agrees not to enter into any contract with any other person, firm or corporation, whereby any of the rights, privileges or advantages acquired by either party by the contract may be impaired. The contract contained a further provision that if Deady desired to sell his exchange, he should give the company the first right to purchase it. It is alleged in the bill of the Valley Home company that Deady's exchange was about to be connected with the Michigan State Telephone Company, the Bell corporation of that state, and connection with the Valley Home Company severed. It is alleged that the Consolidated Telephone Company was organized for the purpose of taking over the exchange of Deady. A notice from Deady to the Valley Home Company that he had had an offer to buy his plant for $25,000 is alleged to have been fraudulently made, the allegation being that his plant is not worth more than $7,000. The complainant is represented by the legal editor of TELEPHONY.

Problems of the Telephone Men

Subscribers may submit for answer in this department any questions on practical telephone topics, such as construction, circuits, electrical theory, troubles, operating, traffic, costs, records, business methods, etc.

The answer to each question will be furnished by a man recognized as expert in that particular branch of telephony.

In case the answer cannot be published it will be forwarded by mail. No charge is made for this service, and subscribers are encouraged to consult us freely and frequently.

In every case a thoroughly complete description of local conditions is required to insure a satisfactory answer.

Phantom Ground Return Line.

We have a grounded line system which connects with a metallic system. We had two lines between offices 50 miles apart. When the company with the metallic system came out to meet us, we used only one line. We have the ground circuit connected through repeating coils. The assistant manager of the company owning the metallic circuit claims that we can work those lines on a phantom circuit, and two quiet lines. I cannot see how it could be done, and ask you if there could be such a thing. I can understand how we could make two physical circuits and a phantom circuit out of four wires, but I cannot understand how we could work the two lines and have them both quiet. This is not very plain, but I am going to wait to hear from you before I do anything.

You can get one partially metallic line and one ground return phantom out of your wires by arranging as shown in Fig. 1.

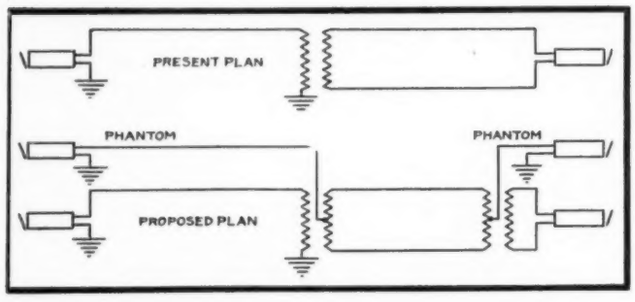


Fig. 1.

But the circuit which is phantomed on the metallic will be ground return all the way. It may or may not be noisy. That depends on the exposure to foreign influences. It is much more likely to be noisy than the line which goes into the metallic circuit at the repeating coil.

Capacity of Wires.

(A) What is the capacity of No. 10 B. W. G. iron wire per mile? Of No. 12?

(B) Is the capacity of wires proportional to the area of the surfaces of the wire?

(A) The fundamental formula which gives the capacity between two wires of a metallic circuit, neglecting the presence of other wires is

$$C = \frac{1}{2 \log_\epsilon \left(\frac{d}{r}\right)}$$

in which d is the distance between the wires, r is the radius of one wire, and C is in electro-static C.-G.-S. units and is for a circuit one centimeter long. "d" and "r" must be in the same units.

The use of hyperbolic logarithms (denoted by "$\log_\epsilon$") is inconvenient. Also, we usually want to know the capacity in microfarads per mile. Multiplying by the proper factors to correct for each of these considerations we have

$$C = \frac{.03883}{\log \left(\frac{d}{r}\right)}$$

in microfarads per mile of circuit.

In the case of an earth return the quantity "d" is replaced by twice the height of the wire from the ground. We will assume 20 feet as the height of the wire.

No. 10 Birmingham gage wire is 0.134 inch in diameter and the radius 0.067 inch. 40 feet=480 inches.

The ratio

$$\frac{d}{r} = \frac{480}{.067} = 7163.$$

Its logarithm is 3.85500. Inserting this in the formula we have .01007 M. F. per mile.

The capacity to ground of No. 12 wire whose diameter is 0.109 inch figures out at .009848 M. F. per mile.

(B) No, as shown in the answer to (A) the capacity has not a simple relation to the area of the wire. Doubling the diameter (and hence the area) of a wire will not double its capacity under these conditions.

Line Resistances.

Will you please inform me which line would have the most resistance, a No. 10 copper with a ground return, or a No. 12 iron, full metallic, both lines being equal in other respects?

No. 10 B & S copper wire has a resistance of about 5.38 ohms per mile of single wire. No. 12 B. W. G., B. B. iron wire has a resistance of about 33.3 ohms per mile of single wire at 68°F. This makes the loop resistance of the iron metallic circuit about 66 ohms per mile. The copper ground return circuit will be of uncertain resistance on account of the earth connections. If good they will not amount to more than a few ohms, say ten ohms each. Hence, the No. 10 copper ground return circuit will probably have a lower resistance than the No. 12 iron metallic.

Getting Acquainted With Wall Street

A Few Pointers on the Big Bankers' Position—How They Look at a Telephone Enterprise—Where We Stand Today

By J. C. Kelsey

This is the beginning of a new feature in TELEPHONY. *Mr. Kelsey has been invited to act as a member of our editorial staff, to build up a financial department in this paper which will mean something. It will be helpful, live, human, and interesting. This is assured by Mr. Kelsey's record and his known ability in this line of work.*

He will need a certain amount of co-operation from the field—if you have anything which will help him, send it in. If you don't agree with all he says, speak out—and then look out for the return argument!—The Editors.

All material things, with the possible exception of the creation of the world in six days, have begun in a small way.

If an engineer, in starting a heavy train, opens the throttle too wide, the wheels show the violation of Nature's habit by hopelessly slipping on the track.

If you throw the full pressure of an electrical current upon an electric motor, you will blow out a fuse or burn out the machine. Consequently a motor is provided with a starting box, so as to compel its starting in a small way. When the motor is up to speed, the whole current is passing through it and the apparatus operates harmoniously.

So shall I begin in a small way. Before I make certain statements, I want to have data, carefully analyzed and put away, so that I can prove what I say.

The world demands proof—Look where Cook came off after the Denmark geographers analyzed his statements.

The Independent telephone business began in a small way. When the pioneer went into it, he had a a few hundred dollars and hoped to equal at least what subscription the Bell interests had.

None expected the phenomenal growth that took place. Your neighbors thought you were crazy and reviled you. You were called a dreamer, and your local banker looked at you in wonder.

Your telephone needs jumped into thousands of dollars and your local banker became interested.

But your needs have grown into hundreds of thousands, and you have grown entirely too large for local banking interests. You are now facing the needs of millions and there is but one place apparently available and that is Wall Street with its minor La Salle Street and other financial rows of fact and fancy. This brings up the question as to who, where and what Wall Street is and La Salle Street as well.

Wall street, of course, is in New York, and La Salle street in Chicago. Both streets end abruptly, the former in a church and the other in a stock exchange and offices of money changers. A strange contrast.

I often wonder about the Nazarene and his attack on the money changers. Did Jerusalem have both a church and a stock exchange terminating a Wall or La Salle street?

But Wall street is not the only street in New York or La Salle street in Chicago where financial deals are carried on. In fact, these streets may be called "The Grand Stand Row." Because real deals are pulled off in other neighborhoods and they do not figure loudly in the popular mind.

Bankers and financial institution officials are intensely human. Even poor abused Wall street is human and you can notice signs of it on La Salle street.

All these corporations have managers who are born of woman, and are of few days and full of trouble. They have reputations to make and keep, and have to guard against errors just like all other employes. A good record and a high salary avail a man naught if he makes just one single fool deal.

They have commendable curiosity and are alert to make successes for themselves and their employers, even as you and I.

These institutions have a code of honor, which I believe to be on a higher plane than any individual code.

I know of one company which financed a failure, being wrongly informed. It calmly notified the customers who had bought these securities and paid them back dollar for dollar. The deal cost it many hundreds of thousands of dollars. But the honor of the house was at stake and it acted promptly as well as honestly.

I fear the individual would have tried to back out, or gone into bankruptcy or whined the usual plea "to err is human," or would have you called a welsher if you complained.

If every individual whined and went into court every time he was cheated, the dishonest dealer would soon be put out of business.

It would astonish you to realize what a steady stream of individuals haunt the "Wall" street interests—schemes of every description, wild and delirious. Very few are worthy, and even then the promoter queers the deal by drawing too hard upon his imagination.

They have to assume that "all men are liars," simply in self-defense. If a man came to you, a stranger, and asked for $10, to be paid back tomorrow, you would suspect something. I know of one man, prominent in telephone matters, who tried to sell his bonds at $78. While he was talking to the banker, a secret telegram to Chicago brought back the information, while the man was still talking, that there were unlimited amounts to be had at $54. Surely, this had a bad effect, at least upon one prominent New York firm.

Truth is mighty and will prevail. It prevails in Wall street and La Salle streets as much as it does on farm or in the shop, and more so, I actually know.

When they are invited to interest themselves in your property, be prepared to pay the expenses of a very rigid inspection. Their auditor will ask you searching questions, and their engineer will look you over with critical eye. It costs money to have such an examination and even then you are not certain that your property will pass the ordeal. So you can see that unless your property is running close to the millions, you cannot afford to do any other way than try to finance your plants locally.

Financial men take nothing for granted. While they have the best auditors to go over your business, if you request, and their own, rather than run the least risk of deceiving themselves they employ the very best outside auditors to check them over again. It is a case of "Physician, heal thyself."

With this point in view, the Independent operator must take nothing for granted, nor deceive himself, nor depend upon his help for information—the very information that goes in court is what these interests require. They will not accept hearsay evidence nor do they have time to listen to generalities.

They like the word economy. Their surroundings may impress you with extravagance. But nevertheless, if economy were not there, they would not be there in business.

I like the word economy, too. Economy has rewards. I hate the word extravagance, for extravagance has naught but sinister penalties. Of course, the only way to analyze or discover extravagance is by measuring it in dollars and cents. Hence you have my first apology for existence as a financial editor.

What determines a good business enterprise is its capability of making money or profit. Profit is the only measure of success, and loss is the prediction of failure. Look about you and think of the number of business enterprises that were apparently prosperous once, and which do not exist now. You will find that the surviving successes can be counted upon your fingers.

Public utility enterprises are peculiar to our own generation. Only a few years ago, there were horse cars on our city streets—you drank water from a cistern in your back yard and helped to put out a fire with buckets because you did not even have water works. Your mother's most disagreeable work was cleaning lamp chimneys and filling kerosene lamps every morning. In fact, you are hardly accustomed to public utility enterprises at all.

To prove this, look at the difference between the treatment of public and private enterprises. Your bank will declare 100 per cent. dividends and your whole town will be proud of the sagacity of the close-fisted or unusually lucky and courageous bank officer.

But if your electric light plant, your gas plant, your water plant, your street railway or your telephone plant would earn 100 per cent. dividends, you would hear a howl of protest as high as Heaven.

The public would demand five cent kilowatts, 50 cent gas, six cent water, three cent fares, and dollar telephones. Your life would not be worth living if you managed such a struggling public utility.

I think the public likes to have poverty stricken public servants about. They read about steel, sugar, copper, meat, tobacco and other predatory corporations and gnash their teeth in hopeless rage.

By way of revenge, they retaliate upon the innocent bystander, the local corporations. But they never ask for more interest upon bank deposits.

Aesop tells of a Greek vaudeville performer who pleased the people mightily by imitating the squeals of a pig. A countryman, a little bit disgusted, concealed a pig under his blouse, and as he pretended to squeal, vigorously pinched the pig's ear. The audience jeered what they thought to be a very poor performance.

Two thousand years later, the public applauded Cook for discovering the North Pole and jeered poor Matt Henson and his Commander for having the real pig under their coat.

As the public are the real investors of money and are the sole judges of their investments, it makes our case all the more complex.

The average man with a little money saved is about as accurate as Pat who thought the moon more useful than the sun because it shone at night when it was needed.

One kind of investor will put his money in New York-Chicago Air Line, or a Cold Motor. His is the kind that is governed by cupidity.

The real investor wants 3½ per cent with absolute security. He knows that municipal bonds are good if legal, and that the Pennsylvania road can pay bond interest without fail and can refund at the proper time.

Time has proved to him that municipal taxes are good security, and that stone bridges, four track railways, and fine terminals indicate a life of 999 years anyway. That should look far enough in the future.

How can the Independent telephone interests reach this class and gain his confidence? That is the question.

I went to a Chicago banker regarding some gilt-edged telephone bonds. And was met with the remark that he had no interest in a proposition using only poles and wires.

I asked if that remark applied to Bell telephone interests and he said it applied equally to Bell as well as Independent property.

Suppose a banker would refuse to take the Armour bonds because all they had to carry on the business were picks to brain steers and hogs.

There is something besides poles and wires. There are many things. There is permanency, and the chances for a telephone company running 999 years are just as good as a railway.

We will always talk and it looks now as if we will fly through the air itself and not depend upon steel rails and semaphores.

One of the most convincing features of Independent telephone activity and its sterling worth as a security is shown in the manufacturing output of one house whose sales in twelve years have amounted to $20,000,000 and whose losses to date are but $18,000.

You can't find a bank with such a record. Banking and manufacturing are considerably alike except that a manufacturer has to trust some people and a bank none.

It means that $20,000,000 has been in the hands of Independent operators from ten days to eighteen months, and only a small loss resulted.

To my mind this record of twelve years is a proud one. While we can't point to losses, we know that it was due to headstrong promotion, where the habit of Nature was violated in not allowing plants to get under way slowly.

Railroads have credit, too—nobody refuses them credit. But they are slower in paying bills than telephone companies. Railroad failures have been numerous in the past and are still numerous even now.

But you have to look far to find a genuine wreck of a telephone company that got under way slowly.

Some people have expressed doubt as to the future of the Independent telephone business, owing to recent developments in Iowa, Indiana and Ohio.

They think the Bell interests are everywhere, and endow a group of ordinary New England gentlemen with superhuman ability.

To my mind, Independent telephone prospects never looked so bright.

The entrance of the house of Morgan has no adverse significance. The loss of Iowa territory is temporary, with the exception of Des Moines. This stronghold will be surrounded by Independent plants again and will surrender.

The Continental Telephone & Telegraph Company will be a great factor. Combine this company with Keystone, Kinloch, Tri-State, K. C. Home, Citizens, and Union of Michigan, National of Wheeling, and you have a powerful influence.

Manufacturing business was better in 1909 than in 1908, and

Your Family Will Appreciate

SOMETHING DIFFERENT

A Years Telephone Service Makes An Ideal Christmas Present FOR THE WHOLE FAMILY.

This is one present that can be used every hour, day and night, and every day in the year. IT IS NOT ONLY USEFUL BUT SAVES TIME & MONEY, and many long walks through all kinds of weather.

the flood of inquiries were never so marked as the December of this year.

With twelve years of experience the Independent operators are fit, as never before, to fight the battles of 1910.

Moral:—They say that it is darkest just before dawn.

This department invites statements, queries and any data bearing on the development of Independent telephone properties. We would like data particularly that will enable us to make an accurate study of toll earnings—as well as rentals.

Joplin Company Shows Good Increase in Six Months' Business.

In a comparative statement for the six months ending Sept. 30, 1909, as against the corresponding period for 1908, the Home Telephone Company of Joplin, Mo., one of the original Gary properties, shows a gain of $3,740.59 in gross income, and a growth of 436 telephones. Following is the statement in detail:

	Six Months, Ending Sept. 30, 1908.	Sept. 30, 1909.	Increase.
Gross Earnings	$60,438.04	$64,178,63	$3,740.59
Expenses	37,557.50	39,688.48	2,130.98
Net Earnings	22,880.54	24,490.15	1,609.61
Interest on Bonds	13,105.00	13,730.00	625.00
Balance for Dividends or Betterments	$9,775.54	$10,760.15	$984.61
Number of Telephones Owned by Company	5,634	6,070	436
Renewal Reserve			$10,733.64
Bonds Outstanding		$542,000.00	
Less Owned by Company		8,000.00	$534,000.00
Capital Stock Authorized		$750,000.00	
Issued			$374,250.00

THEODORE GARY, President.

Christmas Advertising of Telephone Service.

Among the comments on last week's TELEPHONY which have been received, one of the most interesting was a copy of a newspaper from Decatur, Illinois, containing the advertisement of the Home Telephone Company, of which a portion is reproduced herewith.

This company has, apparently, been making rapid progress since its new exchange was installed last spring.

The portion of the advertisment which has been omitted from the present reproduction states that over 1,000 new telephones have been added since last May, while 191 have been added since November 20 and others are coming in at the rate of 7 or 8 a day.

The officers of this hustling company are: J. W. Collins, president; Geo. S. Connard, vice-president; C. B. Cheadle, secretary; P. E. Kuhl, treasurer, and J. A. Portwood, manager.

Record of Growth and Profits Made by a Utah Company.

The Uintah Telephone Company, of Vernal, Utah, operating in the Ashly Valley, formerly known as the Uintah reservation, shows a good report for a small company. The company operates in a district having a population of about 11,000, and the growth in number of telephones in the past year has been 90, while the toll business has grown 25 per cent. Two exchanges are operated, one in Vernal and one in Roosevelt. The system includes about 65 miles of toll line, aerial cable to the extent of 2,000 feet is in place. The entire system is reported to be in very good condition, none of it being more than two and a half years old.

The company is capitalized at $30,000, $19,000 in common stock being issued, and all owned locally by about 25 persons. The company has made no arrangements for immediate extensions or construction, the country being comparatively new, and so the extensions will be taken care of as they are needed.

Dividends of 10 per cent have been paid regularly for two years. The total earnings of the company for the year were not available at the time the report was received last month. They may roughly be figured, however, from the number of subscribers and rates given as follows: Business subscribers 248 at $3 per month; residence subscribers 130 at $2.50.

Officers of the company are: President, William H. Smart, also interested in the Vernal Electric Light Co., Vernal Drug Co., and other business; vice-president, Don B. Colton, receiver in United States Land Office; secretary and treasurer, E. H. Belcher, postmaster, and C. J. Neal, general manager. Directors are: William H. Smart, Don B. Colton, Enos Bennion, R. R. Collett, Charles De Moisy and Snellen Johnson.

News of the Field

South Dakota Convention, Sioux Falls, January 12, 13, 1910; Northwestern Cedarmen's Association, Chicago, January 11, 12, 1910; Nebraska, Omaha, January 18, 19, 20, 1910; Iowa, Council Bluffs, January 20, 21.

Will Morgan Defy the Attorney-General?

The following is a dispatch received from Toledo, under date of December 29:

James R. Brailey, Jr., recognized head of the eight big telephone companies that were recently purchased by J. P. Morgan & Co., today received from Attorney General Grant Denman a letter demanding the names of the purchasers of the property.

"We will make a reply immediately," said Mr. Brailey. "The letters from the Attorney General went to the offices of all of the eight companies involved in the recent big deal."

It is understood that the only information that will be given the Attorney General is that the absolute ownership of the properties is in J. P. Morgan & Co.

Bell Officials on the Rack in Missouri.

C. S. Gleed, president of Bell telephone companies in Missouri is giving testimony at Jefferson City this week. A full account of the important points in the examination will appear in next week's TELEPHONY.

The Situation at Cleveland—Attorney-General Denman Takes a Hand.

Development of information as to the intentions of the new holders of the control of United States, Cuyahoga, Columbus Citizens, Dayton and other Independent telephone companies control of which recently passed to a new owner declared to be J. P. Morgan & Company, by examination in the courts at Cleveland, was conspicuous by its absence during the past week. Nor was anything new developed regarding the stock deals by which control of these great Independent properties passed to the house of Morgan.

Desultory repetition of assertions that the Bell really was behind the deals continued, however, and Tuesday night Attorney-General Denman, whose intentions in the way of legal action to "smoke out" the truth or falsity of allegations of a combine have been the source of speculation for weeks, announced a determined move.

He announced that he had written to officers of the United States, Cuyahoga, Columbus Citizens and Dayton Independent companies asking information as to the recent stock transfers. He also announced that copies of these letters had been sent to the Central Union Telephone Company, in Indianapolis, to the American Telephone & Telegraph Company, the Bell companies, and to J. P. Morgan & Company, as the reputed purchaser of control of the Independent properties, and that he had demanded from each of these concerns all the information in its possession as to the recent transfers.

Attorney-General Denman, in his letters to the three companies, pointed out the frequent assertions in Ohio that the transfers meant the control of the Independents by the Bell, and asked that the companies supply him with all the information on the subject of their stock transactions, adding that his department did not desire to take unnecessary and unfounded legal action, assailing the Bell and the Independents as a trust in violation of the Ohio laws, and that information disproving allegations that the Bell had acquired control of the Independents would relieve him of this necessity.

Unless such information should be given him before January 1, however, he declared he should institute legal action to restore the recently transferred stock to the Independents. Attorney General Denman asserts he is in possession of much information tending to show the Bell interests have acquired such control of the Independent companies as to constitute violation of the Ohio anti-trust law, which prohibits common ownership of parallel lines of communication. This information, it is inferred, is largely that gleaned from the deposition hearings at Cleveland on the suit to nullify the transfer of stock sold by R. H. Goff to R. L. Day & Co. in New York, by which control of Cuyahoga and United States was transferred.

Copies of the letters have been sent by Mr. Denman to Samuel Jeffries, former attorney-general of Missouri, and to H. B. McGraw, of this city, who have been conducting the fight here against transfer of the stocks. The latter it is who have sought appointment of receivers for the United States, basing their petition on the allegation that the United States, through directors who had only a few shares of stock, and these the gift of the new purchasers, intended raising long-distance rates, to throw business to the Bell. These rate raises were made an hour after the petition was filed. Among them are the following significant comparative rates:

	Air Line Mileage	Bell Rate	U. S. Rate
Toledo	80	$0.30	$0.60
Columbus	107	.35	.80
Urbana	127	.60	.95
Springfield	134	.45	1.00
Dayton	154	.75	1.15
Piqua	140	.75	1.05
Lancaster	114	.60	.85
Zanesville	94	.45	.70
Marietta	128	.90	.95
Youngstown	54	.20	.40
Akron	28	.10	.20
Alliance	47	.15	.35
Canton	48	.15	.35
Salem	53	.35	.40
East Liverpool	64	.40	.55
Sandusky	48	.20	.35
Warren	47	.25	.35

"That is merely adjusting and equalizing rates over the state," explains one of the United States directors whose resignation is in the hands of R. L. Day & Company, but who has been alloted enough stock to keep him on the board.

A Statement of the Morgan Policy.

An important announcement was made by a well known financial man of New York recently when questioned concerning the future policy of J. P. Morgan & Co. relative to merging or forming an agreement with the A. T. & T. Co., and which is taken as one of the most important utterances that has been made since it was announced that Morgan & Co. had purchased a controlling interest in the Columbus, Toledo, Cleveland, Dayton and United States Telephone companies. The announcement follows:

"The Independent telephone properties of Ohio and Indiana recently purchased by J. P. Morgan & Co., will continue to remain Independent and will co-operate with other Independent plants in the states of Ohio and Indiana. No effort will be made to merge them with the Bell, and they will be kept up to a high degree of efficiency, but there will be no more disastrous rate cutting. I believe that the Bell will gradually drop out of the local field.

"J. P. Morgan & Co. do want to see the long-distance lines of the A. T. & T. Co. connected with the Independent exchanges, and the influence of the companies owned by the firm will be used in the interest of the dual connection. Let the Independents decide to admit the A. T. & T. wires to their exchanges and the telephone war is over for all time. They will be allowed to keep the local field in peace and the Bell will look after the long-distance business."

U. S. Independent Trial.

In the action begun some time ago by Chas. M. Lane against directors of the United States Independent Telephone Company of Rochester, N. Y., to recover investment losses, a Supreme court jury reported as follows: "There is no cause of action against defendants George Eastman, Hendrick Holden, James S. Watson, H. W. Sibley, or Henry A. Strong, and the jury is not able to agree as to defendants Thomas W. Finucane, Eugene Satterlee, Albert D. Fenn and William H. Page."

Attorneys for the plaintiffs have now moved for a new trial in the case on the ground that the decision was contrary to the evidence, and for other alleged causes.

Morgan House Suspected of Invading West Virginia.

H. W. Backhus, secretary of the Columbus Savings and Trust company, returned recently from New York, where he was in consultation with the officials of the Trust Company of America relative to the deposit of a controlling interest of the stock of the Charleston (W. Va.) Home Telephone company. The deal for this large Independent concern was closed recently through the Columbus bank. Mr. Backhus said that he had no real knowledge as to who the purchaser of the controlling interest of both the common and preferred stock was, but that the money was paid over to him by the Trust Company of America. However, as that trust company is believed to be closely connected with J. P. Morgan & company it is generally presumed that the Morgan company had considerable to do with the deal. The control of the Charleston company is important to the Morgan interests in Ohio and Indiana as it has contracts for long-distance service with the United States Telephone Company.

What "Finance" Thinks of the Morgan Deals.

In the Dec. 25 issue, "Finance," of Cleveland, says:

"The control of the Cuyahoga Telephone Company, the United States Telephone Company and a large number of other Ohio and Indiana telephone companies has been purchased by J. P. Morgan & Co., of New York, not with the intention of consolidating them with the Bell company, but with the undoubted intention of building up a large Independent rival of the Bell Telephone Company. When the announcement was first made that Brailey had sold these companies to Morgan the public was inclined to be skeptical and look upon the announcement as an attempt to evade the state and national anti-trust laws. The public, however, is rapidly becoming convinced that they were mistaken and that Morgan expects to develop the plants he has purchased, add to their physical property and to their earning capacity. As nearly as we can arrive at the situation, it seems to be something like this:

"Some time ago, how long ago we are unable to determine, large financial interests of New York decided that the Bell's policy of cut rate competition with the Independents was wrong and only resulted in injuring Bell earnings and Independent earnings. They furthermore came to the conclusion that it was impossible to eliminate the Independents from the field either by purchase or ruinous competition. It was their opinion that the way to deal with the situation was for the so-called big interests in New York to purchase these Independent telephone companies, put them together as one and develop them. In so doing they decided that they would work on a friendly basis with the Bell Telephone Company, doing away with competition, developing the territory, raising the rates and making large profits for both Independent and Bell. This is the situation today, and the plans of the Morgan syndicate have not been made public for the simple reason that those back of the movement, have not as yet by any means purchased all the Independent plants they desire."

Nebraska Railway Commission Rules Against Coupon Discounts on Telephone Supplies.

On request of an operating company for a ruling on the subject, the Nebraska Railway Commission has given its opinion that it is illegal for a manufacturer of telephone supplies to offer its customers in Nebraska a 25 cent discount coupon with every $10 worth of supplies purchased, as had been done by a Chicago manufacturer. The commission stated that such a scheme could easily lead to discrimination, "in which special rates and privileges would be concealed in the purchase price of equipment."

Reorganization of Arizona Telephone Companies.

A report from Phoenix, Arizona, states that representatives of the Overland and Home telephone companies have completed plans for a merger of the two corporations.

The directors of the new company are as follows: P. T. Hurley, C. H. Pratt, Frank Alkire, Phoenix; J. W. Weatherford, Flagstaff; David Connor, C. H. Rutherford, Jerome, and A. C. Webb, Roosevelt.

Stock is to be redisposed of on the basis of Overland at 25 cents a share, and Home at $10.

Contracts for a new switchboard and construction material amounting to $90,000 have just been signed. It is expected that the system in Phoenix will be in operation by February 1. The company is understood to have, at the present time, about 800 subscribers.

Important Combination of Independent Lines in Washington.

The Washington Southern Telephone Company has been organized in Spokane with a capitalization of $100,000 to merge the interests in the State of Washington of the Montana Independent, The Home and the Interstate companies, with through connection into St. Paul and traffic arrangements with Independent telephone lines out of Salt Lake City. Towns

TELEPHONY'S
1910 Directory of the Telephone Industry

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TELEPHONY PUBLISHING COMPANY, Monadnock Block, CHICAGO

in British Columbia and Oregon will be connected under the new system. The officers are: President, Charles R. Cushman, of Spokane; vice-president and secretary, Charles M. Cooley, of Aberdeen, S. D.; treasurer, D. W. Cushman; directors, Lewis V. Gray and Clarence M. Thomas. The executive offices will be in the Lindel building, Spokane, with exchange offices at Harrington, Wash. The company has terminals at Portland and other cities on the Pacific coast.

The company will work directly west and south, connecting with Pasco, thence with cities along the Columbia river into North Yakima, through Ellensburg and directly west, connecting with the Everett Independent lines operating eastward out of Everett, Wash. British Columbia and Oregon towns will be connected by this plan.

A contract is reported to have been made with the Postal Telegraph Company for an exchange of service. The telegraph company will use the telephone exchanges for telegraph offices and a reciprocal arrangement is to be made with the Postal company for telegraph service.

The object of the Washington Southern Company is to build up western Washington and northern Oregon. The Montana Independent, the Home and the Interstate Telephone companies effected a working consolidation two months ago.

Pittsburg Section, A. I. E. E., Discuss Telephone Transmission.

The Pittsburg Section of the American Institute of Electrical Engineers held its regular monthly meeting in the Carnegie lecture hall on December 14, 1909. A paper was given by Messrs. E. B. Tuttle and W. V. Read of the Central District and Printing Telegraph Company on "Telephone Transmission and the Oscillograph." Mr. Tuttle exhibited oscillograms showing the character of current waves produced by different types of transmitters, the effect of a cable in the subscriber's loop and in the inter-office trunk line.

The phase shift produced by a loaded cable was shown both for the current and voltage waves at the two ends of the circuit. Mr. Tuttle has succeeded in obtaining oscillograph curves of telephone speech currents which are capable of accurate analysis to the ninth harmonic. One thing made very evident in the paper was the fact that the even harmonics are fully as important in speech current waves as are the odd harmonics.

Messrs. S. P. Grace and R. A. L. Snyder of the Central District and Printing Telegraph Company, Mr. H. W. Fisher of the Standard Underground Cable Company and Mr. B. P. Rowe of the Westinghouse Electric & Manufacturing Company discussed the paper and stated they considered the results given to be of very great importance to the telephone industry.

Michigan Supreme Court Rules to Preserve Competition.

The Supreme Court of Michigan, as stated in the Dec. 18 TELEPHONY, has refused to grant the American Telephone & Telegraph Co. the right to do both a telephone and telegraph business in the state.

The opinion was written by Judge Brooke, of Detroit, and commenting on the policy of the Michigan legislatures to keep the telephone and telegraph business separate, he says:

"At the inception of the telephone, messages could not readily be transmitted long distances and many communities were without service.

"To-day the telephone line extends to nearly every village in the state and a very large and constantly increasing number of rural inhabitants enjoy its use.

"Wherever the telegraph line is, there, too, is the telephone. In the hands of an independent agency it may well be that a healthy competition for the transmission of information by electricity will ensue.

"We are of opinion that the legislative enactments touching the question indicate a policy on the part of the state to afford its people a choice of two agencies of independent ownership.

"It is quite clear in the light of separate enactments and the policy indicated thereby that we could not hold a domestic corporation capable of transacting both kinds of business. We think it logically follows that no foreign corporation should be given a privilege denied to those of our own creation, particularly when to do so would be subversive of the policy of the state."

The company also claimed that in any event it has the right to choose which business it shall do, telegraph or telephone, but as that question was not before the court the point was not decided.

Whether the company can find any way of getting around this decision, or what steps will be taken to that end, are questions on which no one seems willing to hazard an opinion.

Two Letters From Mr. E. L. Barber.

TELEPHONY is in receipt of the following letters from Mr. E. L. Barber, of Wauseon, Ohio, which are self-explanatory:

December 24, 1909.

"Publishers of TELEPHONY,
Monadnock Building
Chicago, Illinois.

"Gentlemen:

"I have today addressed a letter to The Securities Weekly Company, 80 Wall Street, New York City, of which I enclose you a copy, and which explains itself, and which I would be pleased to have you publish in your next issue.

"Yours very truly,
(Signed) E. L. Barber."

December 24, 1909.

"The Securities Weekly Company,
Publishers of "Telephone Securities,"
80 Wall Street, New York City.

"Gentlemen:

"The statement on page six of your issue of December 18th to the effect that Mr. James S. Brailey, Jr., ever cheated or attempted to cheat me in any way, or that he accepted any "rake-offs" on property purchased by him in which I was interested, directly or indirectly, is false and wholly without justification.

"Mr. Brailey and I were partners for a number of years, and during all of that time never had a particle of difficulty between ourselves, and Mr. Brailey's dealings with me were entirely satisfactory, business-like and fair. I very much regret that you have made this unfounded statement against my former partner and coupled my name with it, and I ask you to have the decency to retract the same.

"Yours respectfully,
(Signed) "E. L. Barber."

Prospect of Independent Service for Natchez, Miss.

Mr. Rush, of Jackson, Mich., has applied to the city council of Natchez, Miss., for a franchise to construct and operate a telephone system in that city, in an attempt to get Independent service into the city. Independent companies in that state are now strong and active, and are watching this development carefully.

Kellogg-Dean Merger Off.

A report is current in Chicago this week that the proposed combination of the Kellogg and Dean manufacturing companies is definitely off. There have been rumors afloat for some time expressing a belief that the matter would never be brought to a conclusion, but it is now stated on good authority that there is no prospect that the deal will ever be concluded, and that both companies will continue to direct their business absolutely independent of each other, as they have been doing right along.

Telephone Patents

Conducted by Max W. Zabel

LIGHTNING ARRESTER.

E. W. Vogel, Chicago, Ill., patent 940,220, Nov. 16, 1909.

This arrester comprises a supporting base of insulating material, posts spaced apart and supported upon the base, a coil of wire interposed between and electrically connected to the posts, an insulating tube supported between the posts and around which the coil is supported, a coil of wire within the insulating tube, the convolutions of which intersect the planes of the convolutions of the conducting coil, and a grounding conducting plate located adjacent the conducting coil.

TELEPHONE CABINET.

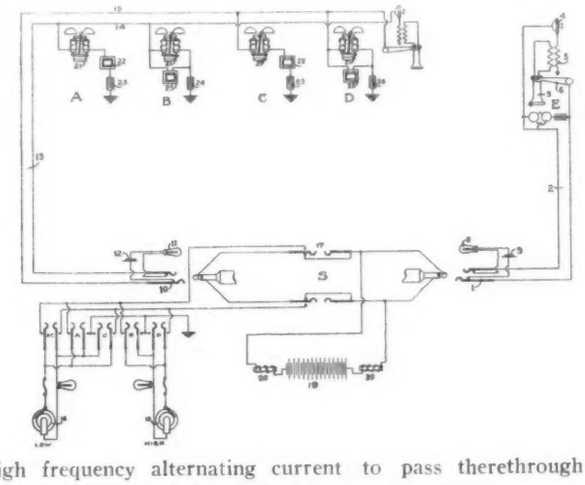
C. E. Oxford, Fayetteville, Ark., patent 941,336, Nov. 23, 1909.

This cabinet is designed to be accessible both from front and rear, and comprises a housing having a hinged closure at the front, and an open back portion. A backboard is provided which has electrically connected hangers extending therefrom. The hangers have a shank portion engaged with the backboard and provided with a horizontally disposed shoulder and an upwardly extending finger disposed in spaced relation to the backboard. Contact members are secured to the sides of the housing adapted to frictionally engage the hangers and have horizontally disposed pins adapted to rest upon the shoulders.

SELECTIVE SIGNALING SYSTEM.

O. M. Leich, Rochester, N. Y., patent 943,115, Dec. 14, 1909; assigned ⅓ to J. G. Ihmsen and ⅓ to Max W. Zabel, Chicago, Ill.

This four party system consists of the four polarized ringers 21, those at stations *A* and *C* each having an impedance coil 22 and condenser 23 in series. Those at stations *B* and *D* each have an impedance coil 25 in bridge and a low capacity condenser 24 serially in the ringing circuit. The impedance coils 22 are so constructed as to let a low frequency alternating current there through to ring the bell, but prevent a high frequency current from flowing through in sufficient quantity to ring the bell. Conversely the condensers 24 permit

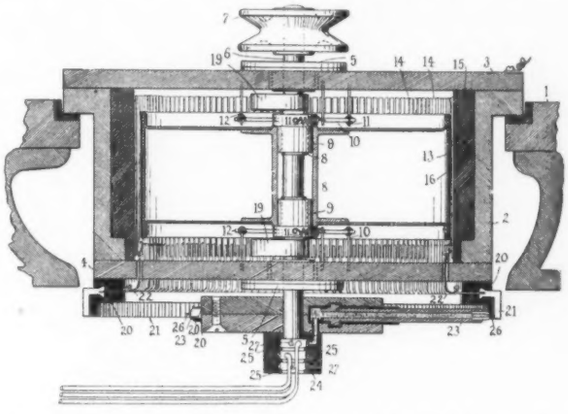


high frequency alternating current to pass therethrough to ring the bell but choke the low frequency current.

TELEPHONE REPEATER.

P. A. Campbell, Bloomfield, N. J., patent 942,885, Dec. 14, 1909.

This repeater is built so that the electrical energy of the currents in an incoming telephone circuit is stored in a series of condensers which are momentarily connected in turn in the incoming circuit; then the plates of the charged condensers are mechanically separated, thereby lowering their capacities and amplifying the energy of the charges; then the condensers are connected in turn in an outgoing circuit and the amplified charges are discharged. The condensers consist of plates 14 mounted circumferentially and a plate consisting of the drum 13 which is brought successively close to the plates 14 by the



revolving eccentrics 9,9. Mica 16 is interposed to prevent electrical contact. Each plate 14 is connected to a commutator segment 21, and mercury jets 26 complete the connection.

INTERMEDIATE TELEPHONE CONNECTOR.

C. A. Hearn and Wm. H. Feddejohann, Decatur, Ind., patent 941,519, Nov. 30, 1909.

This device is designed to connect a telephone on a car with line wires anywhere along the right of way. It consists of a rod having two fixed hooks pointing toward each other to which the two flexible wires leading to the telephone are connected. The rod being thrown over the wires and drawn inward, the hooks engage the wires making a good electrical connection by reason of the hooks being closer together than the distance between centers of the wires.

BANK OF LOCKING SWITCH-KEYS.

E. R. Corwin and C. A. Bals, Chicago, Ill., patent 941,763, Nov. 30, 1909; assigned to Corwin Tel. Mfg. Co., Chicago, Ill.

This bank of switch-keys comprises a frame and a plurality of push buttons, all adapted to be mounted in a suitable base. A distributing strip with terminals is mounted upon the frame so that conductors leading from the push buttons may be connected with external conductors, leading to the bank of keys. A removable casing is provided which encloses all the parts and has a hole for the entrance of the connecting cable.

CABLE HANGER.

C. L. Pierce, Jr., Chicago, Ill., patent 941,039, Nov. 23, 1909; assigned to W. G. Nagel Electric Co., Toledo, Ohio.

This hanger has a messenger straddling member, having bifurcated ends to hold the flexible cable supporting rope by means of knots.

ILLUMINATED TELEPHONE DIAL.

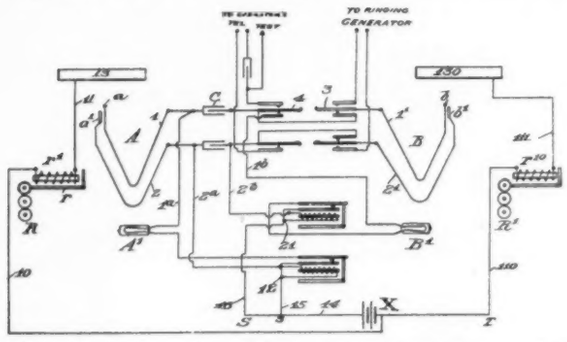
R. B. Hallock, Portland, Oregon, patent 943,305, Dec. 14, 1909.

This patent is to provide a dial for automatic telephone instruments in which there is a translucent sector, on which the numbers or letters corresponding to the finger holds are placed. A lamp is mounted behind the sector to illuminate it.

CALL REGISTERING SYSTEM.

Wm. J. Kibbe, Canandaigua, N. Y., patent 943,081, Dec. 14, 1909.

This device is designed to register the traffic of a switchboard position, by counting the number of incoming calls and the number of outgoing calls or both together. To this end call registers R and R^1 are used which are under the control



of relays r^1 and r^{10}. The relays are connected at one of their terminals to battery and at their other terminals to contact strips 13 and 130 respectively. When a call comes in, the operator touches the tip of her answering plug to the strip 13 with the same movement inserting the plug in the jack. In the same manner the calling plug can be used in connection with the strip 130.

MOUTHPIECE.

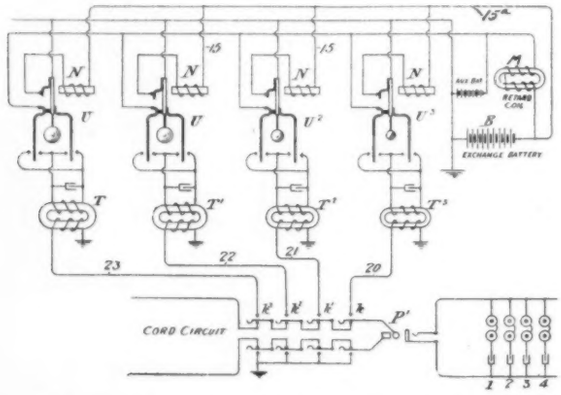
J. A. Jamieson, Harrison, N. J., patent 943,149, Dec. 14, 1909.

This mouthpiece is designed to have two open ends to prevent it is claimed the objectionable effect of muffled sounds when talking into a closed chamber. To this end a trumpet member having a tubular body portion with open ends and a tubular connection leading laterally from it by which it is fastened to the transmitter, is used.

HARMONIC CONVERTER.

Ray H. Manson, Elyria, Ohio, patent 942,091, Dec. 7, 1909; assigned to Dean Electric Co., Elyria, Ohio.

This invention relates to the harmonic current converter and is designed to prevent noisy lines when the regular common exchange battery is used to operate the converter. As

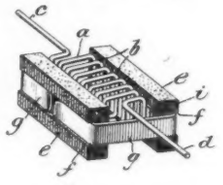


shown, the cord circuit is connected to the transformers T, T^1, T^2 and T^3, which are connected to the vibrating elements U, U^1, U^2 and U^3 respectively. A choke coil M is inserted between the contacts of the vibrating elements and the battery B to prevent noise on the subscribers' lines. It reduces the efficiency of the pole changers for signaling as the peaks of the waves are too much flattened and reduced below the shapes and dimensions which give the best results in ringing. To remedy this an auxiliary source of current is used, floated across the main battery wires. This auxiliary battery it is claimed momentarily supplies at each impulse the necessary peak.

LIGHTNING ARRESTER.

C. T. Mason, Sumter, S. C., patent 940,176, Nov. 16, 1909; assigned to Sumter Tel. Mfg. Co., Sumter, S. C.

This arrester has a choke coil a, whose terminals c and d are adapted for connection in the circuit. Carbon blocks e, e are arranged along the straight sides of the coil a, to take



the discharge, and sharp angles b, are provided in the coil to retard the lightning discharge. The entire structure is mounted on a suitable insulating base.

TELEPHONE CALL RECORDING DEVICE.

G. R. Fawkes, Waterloo, Iowa, patent 940,140, Nov. 16, 1909.

This invention relates to improvements in telephone call recording devices, and provides means whereby a record may be made and kept of the calls, whether local or long-distance.

INDICATING COIN HOLDER.

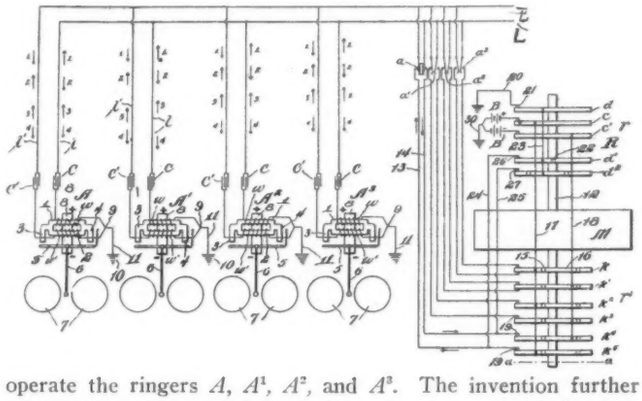
Elijah F. Stone, Chicago, Ill., patent 941,824, Nov. 30, 1909.

This coin holder is designed for use with telephone slot machines and has means to indicate the number of coins used in any given period of time.

SELECTIVE SIGNALING SYSTEM.

R. C. Welty, Omaha, Neb., patent 942,763, Dec. 7, 1909.

This signaling system consists of four polarized biased ringers A, A^1, A^2 and A^3, each having two windings w and w^1 connected between opposite line wires and ground. Springs are shown at one end of the armatures 5. Condensers c and c^1 are inserted to prevent battery loss. The operation of the ringers depends upon condenser charges and discharges and upon the polarities of the current impressed upon the two line wires, also upon the direction of winding of the two coils of each ringer and the biasing springs. The arrows 1, 1; 2, 2; 3, 3; and 4, 4 show respectively the directions the currents must take to



operate the ringers A, A^1, A^2, and A^3. The invention further contemplates the use of a special commutator mechanism for supplying the ringing currents.

GROUNDING DEVICE.

Wm. R. Garton, Brooklyn, N. Y., patent 938,471 Nov. 2, 1909.

The present invention aims to provide a hygroscopic ground terminal which shall attract moisture to itself and retain the same indefinitely and at the same time keep the surrounding earth moist, and be of low resistance. The invention provides a ground terminal which is practicallly non-electrolytic, of low resistance and large capacity. It consists of a member or body molded in any suitable form, composed of a combination of chlorid of potassium and chlorid of sodium, or other similar

materials, and suitable binding powders, with which may be mixed granulated coke or charcoal, to extend the body into a sort of honeycomb or sponge in so far as having a cellular structure is concerned, which would to a certain extent accommodate moisture. When the above mixture is pressed into a mold, a chemical action takes place which eventually causes the combination to assume a hard and solid form and be highly absorbent.

Manufactures and Sales

Dean Booklet on Intercommunicating Systems.

Under the title of "Intercommunicating System Construction Book" the Dean Electric Company, Elyria, Ohio, has recently issued a booklet which is the first of a series, of uniform size, covering all the subjects relating to telephony.

The first section of the book is devoted to the question of installation of intercommunicating systems. It discusses thoroughly the whole subject from the location of the stations, etc., to the testing out and placing in operation of the system.

Another section of the book takes up the care of the talking and ringing battery. This chapter dwells at considerable length upon the necessity for proper arrangements of cells, methods of wiring, etc. Suggestions are also made regarding the testing of cells and a list is given of the indication of battery troubles and their possible remedies.

A section of the booklet entitled "A Few Cable Needs" is comprised of an article written by Ray H. Manson, which appeared in TELEPHONY in February, 1907. It deals with switchboard cable construction, methods of determining cable lengths, stripping cable, "butting" cable, waxing, soldering, completing the form, etc. The points brought out are not new to most men handling switchboard cables, but the right way in which to handle various cases is pointed out.

The last chapter of the book deals with the Dean Intercommunicating System exclusively. It explains the method employed in calling stations, methods of trunking to a central office, and also takes up the question of the attendants' stations, which are necessary to handle incoming calls.

In the new Dean intercommunicating system, the circuits are metallic, the keys are of accessible design with pure platinum contacts and are so arranged as to have the line wires soldered directly to the terminals. A full sized bell of new design is used in the ringing or signaling in place of the ordinary buzzer. This bell, it is said, will operate without creating noises in the talking circuit, and does not require an exact amount of current to insure positive results.

The attendants' station equipment is mounted in a single cabinet so that all the trunk lines, signals, intercommunicating relays, etc., are together in one place. The circuits are so arranged that the same kind of trunk service can be given as with a modern private branch exchange switchboard.

The booklet contains matter on the installation of intercommunication systems which probably has never before been collected in this form. The Dean company will mail a copy of the address of present users or prospective customers for this type of equipment upon receipt of a request. As the information contained in the book can be applied in installing other systems than the Dean, the booklet, which is of convenient pocket size, will interest all men engaged in intercommunicating work. For this reason the Dean company will send the book to anyone upon receipt of fifty cents.

Rock Island Battery Company Has New Factory.

From a handsome, modern new factory the Rock Island Battery Company, of Cincinnati, is preparing to send Happy New Year greetings to its customers and the trade in general. The rise of the Rock Island has been phenomenal. From a modest start in the Illinois city from which the dry cells take their name, the Rock Island Battery Company accepted the opportunity to broaden its field of business activities and went to Cincinnati. In that Ohio city the company has grown and prospered. Increasing demand made several changes of quarters imperative until necessity compelled the abandonment of the down-town plant and the acquisition of a handsome steel and concrete structure on Spring Grove avenue at Winton place, within Cincinnati's suburban limits.

The new factory is five stories in height and the main building covers 150 by 50 feet. The main factory is well lighted on all sides by seven-foot windows, arranged on pivots and located three feet apart all around the building. This insures plenty of air as well as light. The general offices on the second floor are handsomely equipped.

Besides this main factory, there are two adjoining commodious buildings, which increase the total floor space to approximately 100,000 square feet. The Rock Island Battery Company will have shipping facilities that are not excelled. Its own private switch runs to the doors of the factory and is directly connected with the Baltimore & Ohio, Big Four and C., H. & D. Railroad tracks, while the belt line provides for quick transfer to fast freight lines.

Located on the street car lines, the new plant is within easy access of the heart of the city. For the past two years increasing business of the Rock Island Battery Company has been hampered by lack of room. The manufacture of Rock Island dry cells will be pushed, and, with increased facilities, this growing firm will be equipped to take on a great deal of new business, which it has had to refuse in the past.

AUTOMATIC ELECTRIC CO., Chicago, has sold a 10,000 line capacity exchange with present equipment, including subscribers' telephones, for 1,500 stations, to be installed at Huron, S. D.

A Durable and Handy Pocket Diary.

The "Westinghouse Diary for 1910" is the title of a little book which is worthy of special note because, in the first place, it is attractively bound; then because the cover is durable; and finally and best of all, because the inside of the book is of some real use. It contains a calendar, a little information about electric railway and transmission systems, wire tables, that indispensable and never available bit of information, "How to remember wire tables," storage battery information, maps of the United States and the world, a list of good hotels, and other good things too numerous to mention.

This book will be sent to officials of telephone companies on application to Mr. J. C. McQuiston, manager of the Westinghouse Companies Publishing Department, Pittsburg, Pa.

New Stromberg-Carlson Salesman in Kansas.

Mr. F. E. Chappelow, of the Stromberg-Carlson Telephone Manufacturing Company, has been transferred from special duty in the Chicago territory to the position of traveling representative in the state of Kansas under the jurisdiction of the company's Kansas City branch office.

Mr. Chappelow has had a thorough training and experience as the company's installer and special representative as a party line expert, and will begin January 1 to make new acquaintances in the state of Kansas.

New Style of Wasson Reel.

The Wasson Reel Co., of Clinton, Ill., has recently brought out a double reel which supplements its well-known single reel. This production is the result of the number of applications which the company has had for a reel to pay out two wires at a time instead of one wire. It is claimed that the difficulties encountered with double decked reels have been successfully overcome in this reel. The reel is made to fold enabling it to be wheeled along the sidewalk. But one man is necessary to transport the reel with the

New Wasson Reel Ready for Transportation.

wire upon it as the coils are perfectly balanced over the wheels.

In some way, many telephone companies seem to have gotten the idea that it was necessary to buy one of the patent carts upon which the Wasson reel is ordinarily mounted in order to get the reel itself. Mr. Wasson desires to correct this impression, as the reels are sold separately without the cart. This enables purchasers to mount them on wagons and utilize them as they have been accustomed to for years.

Big List of Exhibitors for Chicago Electrical Show.

The scheme of decoration for Chicago's fifth annual Electrical Show will again be of the startling character, outclassing in beauty and novelty anything that has ever before been disclosed in a trade exposition in America. This is the prediction of the Electrical Show management which has, as yet, not failed in producing decorations that opened in wonderment the eyes of visitors. When the show opens on Saturday afternoon, January 15, the great roof of the Coliseum will have been hung with thousands of yards of golden tinsel upon which, from the north and south balconies great and powerful projectors will throw floods of light which will change in color from time to time creating a spectacular scintillating effect that should be amazingly attractive in beauty and color.

In the center of this mass of brilliancy will be suspended the Wright aeroplane which will come to the show as a U. S. Government exhibit by order of Secretary of War Dickinson. This is the first time the government has placed this machine on exhibition and it comes here purely in the interests of aeronautics and electrical science.

More exhibition space for the 1910 show has been sold than

Wasson Double Reel Ready for Use.

ever before and the list of exhibitors as a whole is, by far, much more representative. They also, as a whole, cover every branch of the electrical industry. A partial list is as follows: American Steel & Wire Co., Chicago; Fort Wayne Electric Works, Fort Wayne, Ind.; The Acme Wire Co., New Haven, Conn.; Electrical Testing Laboratories, New York; Long Beach Elec. Mfg. Co., Long Beach, Cal.; Milwaukee Vacuum Mchy. Co., Milwaukee, Wis.; Swedish-American Tel. Co., Chicago; Duntley Mfg. Co., Chicago; Federal Electric Co., Chicago; Driver Harris Wire Co., Harrison, N. J.; Neville Ill'g Sign Co., Chicago; Simplex Elec. Heating Co., Cambridge, Mass.; Grand Ledge Clay Product Co., Chicago; M. Klein & Sons, Chicago; Vulcan Elec. Heating Co., Chicago; Popular Electricity, Chicago; Illinois Appliance Co., Chicago; Chicago Pneumatic Tool Co., Chicago; Perfection Vacuum Cleaner Co., Chicago; Westinghouse Elec. & Mfg. Co., Pittsburg, Pa.; Stromberg-Carlson Tel. Mfg. Co.; A. W. Kratz; General Acoustic Co.; National Electric Lamp Assn.; American Sign Co.; G. M. Gest; Thompson Bros. Co.; Hoover Suction Sweeper Co.; Stromberg Electric Mfg. Co.; Fairbanks, Morse & Co.; Chicago Fuse Wire & Mfg. Co., Chicago; TELEPHONY Pub. Co., Chicago; Cutler-Hammer Mfg. Co., Milwaukee; Hahl Automatic Clock Co., Chicago; G. L. Jackman, Chicago; Henry Newgard & Co., Chicago; E Z Vacuum Cleaner Co., Chicago; Appleton Electric Co., Chicago; National Carbon Co., Cleveland, Ohio; Stoltz Electrophone Co,. Chicago; Electro Magnetic Tool Co., Chicago; Empire Vacuum Cleaner Co., Winona, Minn.; General Electric Co., Schenectady, N. Y.; National Battery Co., Chicago; Electric Storage Battery Co., Chicago; Manhattan Electric Co., Chicago.

A Rustless Cable Hanger.

Various kinds of cable hangers have been placed on the market from time to time. The cable hanger shown below and known as the H-P Rustless Cable Hanger, is stamped out of sheet zinc, and is complete in one piece. It is therefore dur-

The H. P. Rustless Cable Hanger.

able and being of zinc, affords a good metallic connection between the messenger wire and the lead sheath of the cable. This feature localizes or confines the damage by lightning and high tension crosses, thus reducing cost of maintenance. It binds tightly on the cable and, being flat, does not interfere with the cable car riding readily over the messenger wire. The hangers are put up in small boxes containing 500 each, which are of a convenient size for carrying under the arm. The hanger is attached by holding the circular end against the cable and winding the free end, twice around and once over the messenger wire. Many prominent telephone companies have used this hanger and are well satisfied with it. It is made by H. F. Copeland, 127 Franklin Street, New York City.

North Electric Co. Makes Quick Installatcn After Fire.

The exchange at Utica, O., was entirely destroyed by fire on December 9. An order for new equipment was placed with the North Electric Co., of Cleveland, Ohio., December 10. A three position magneto transfer board, equipped with 420 lines and 36 cord pairs, including heat coil protection, cable, etc.,

were shipped December 14. Material reached Utica December 15, and the installation was completed December 18.

Considering the fact that one of the intervening days between the time of placing the order and the date of shipment was Sunday, the record is one for which both the manufacturer and the operating company should be congratulated.

American Electric Fuse Company, Muskegon, Michigan, with branch offices at San Francisco, California, is now manufacturing rheostats and electrical controlling devices for both alternating and direct current, ignition apparatus for automobiles and gas engines, black enameled wire and a large number of specialties which are meeting with a heavy sale.

Maxim Specialty Company, 12 Waverly Place, New York, is mailing order cards of an interesting type, and descriptive literature, to show the usefulness of its "Antiseptic" glass telephone mouthpiece. The mouthpiece is snapped into a metal socket, which is fitted with threads to screw into the transmitter. Covering the circular opening at the base of the glass is a single thickness of medicated antiseptic gauze, through which the telephone user speaks. The gauze can be changed as frequently as desired, and very conveniently, by simply removing the glass from the springs which hold it, taking away the old gauze, inserting a new piece, and snapping back the clear glass mouthpeice.

H. W. Johns-Manville Co. has recently appointed Mr. H. H. Seaman assistant manager of its New York electrical department. For seven years Mr. Seaman was associated with the Electric Storage Battery Co. at Philadelphia, Detroit and Cleveland, and for the past two years has been manager of its Atlanta office.

Rome Wire Company, successors to The Wire & Telephone Company of America, Rome, New York, has issued a calendar portraying a beautiful Indian maiden, which is fully as expressive of merit of one type as the company's goods are noted for quality in their line.

The Duplex Metals Company, Singer Bldg., New York, is sending out a folder setting out the merits of its "Copper clad" steel wire, in the statement that "it does not sag or stretch or cross." Figures giving the elastic limit of "Copper clad" No. 12, and copper No. 10 wire are given in support of the statement "When it's up, it's up to stay."

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

J. H. AINSWORTH, general manager of the Home Telephone Company, of Dayton, Ohio, was recently elected president of the National Automatic Telephone Association. Members of this Association carry on a correspondence, considering problems and exchanging experiences. The members are made up of automatic exchange men throughout the country.

OBITUARY.

DAVID THEWLIS, president of the Co-operative Telephone Company of Linden, Ind., died on December 16.

NEW COMPANIES.

ARCO, IDAHO.—The Arco Telephone Company is the name of a new corporation recently granted articles of incorporation by the secretary of state. The company is capitalized at $1,500 and the officers are: John W. Fowler, president and manager; Otto B. Flisher, vice-president, and W. Sweet, secretary and treasurer.

FOLSOMVILLE, IND.—The Folsomville Farmers' Mutual Telephone Company was incorporated with a capital stock of $1,000. The directors are: A. M. Fisher, Robert Perigo, P. D. Gannon, G. L. Wilhaus, J. W. Roberts, Robert Skelton and W. N. Boyd.

HAZLEON, IA. (Buchanan County.)—The Hazleton Farmers' Telephone Company has filed articles of incorporation with the secretary of state. The capitalization of the company is placed at $10,000, and the officers of the company are: President, D. N. King; vice-president, J. D. Allen; secretary, E. J. Short, and treasurer, George Nibeck. The incorporators are D. N. King, John D. Allen, E. J. Short, George Nibeck, R. G. Koile, C. M. Halbert, Cyril Arthaud, John Walton, F. Deuhr.

POOR FORK, KY.—W. W. Cornett and others here will organize a telephone company. They will construct and maintain a local, Independent line at Poor Fork; also build a line from Poor Fork to Harlan, Ky., 22 miles.

EWEN, MICH.—The secretary of state has granted a charter to the Ewen Independent Telephone Company. A. J. Waring is owner and manager.

ANGELICA, N. Y.—The Barber and Taylor Hill Telephone Company is the name of a new corporation, recently organized by the residents of Barber and Taylor Hill near Rushford. Connections will be made by the company with the Rushford Telephone Company's exchange. Contracts for the construction of the system have already been let. Officers of the company are: E. M. Olney, president; Howard Luce, vice-president; William Barber, treasurer and R. A. Taylor, secretary.

DOVESVILLE, N. C. (DARLINGTON CO.).—A charter has been granted the Dovesville Telephone Company. Capital stock, $700.

MARTIN, N. D.—The Sheridan County Telephone Company was recently incorporated with a capital stock of $20,000 by A. H. Nickaulos, G. Kalk, Karl Schauer and others, all of Martin.

NOONAN, N. D.—Henry J. Kotschevar, Rold Reite and Albert H. Makee are the incorporators of a telephone company to be known as the Mutual Telephone Company. The company has an authorized capital of $15,000.

ROLETTE, N. D.—The Ox Creek Telephone Company has been organized with the following officers: J. T. Tweten, president; H. M. Ambel, secretary, and John Lund, treasurer. A line will be constructed to the south and east for a distance of about 12 miles.

RUGBY, N. D.—The Western Telephone Association is the name of a new company organized with a capital stock of $50,000. The incorporators are John Richey, Brazil, N. D.; A. B. Fox, Brazil, and W. E. Fox, Rugby.

PONCA CITY, OKLA.—A charter of incorporation has been granted the Bois de Arc Valley Telephone Company. The company has an authorized capital of $600,000, and the incorporators are C. G. Crawford, B. F. Coale and H. E. Copeland.

VALLIANT, OKLA.—The name of a new telephone company recently incorporated is the Big Ten Telephone Company, with a capital stock of $2,000. The incorporators are Wm. J. Moore, Eugene Roberts and P. A. Wilbur, all of Valliant.
ferson.

FARNSWORTH, PA.—The Irish Valley Telephone Company is the name of a new corporation recently chartered. The following officers were elected to serve the interests of the company: L. Farnsworth, president; George A. Dunkelberger, secretary; Tobias Dunkelberger, treasurer. The directors are Dr. J. J. Keller, John H. Lantz, Silas Chamberlain, H. C. Olmstead, H. A. Snyder, J. H. Chamberlain, W. E. Richie, Palmer E. Klinger, William Brocius, H. W. Dunkelberger, George Clark and I. F. Herb. The capital stock of the company is to be $5,000. Systems will be built and operated in the counties of Northumberland, Snyder, Union, Columbia, Schuylkill and Dauphin, and connection will be made with the American Union Telephone Company.

GLEN ROCK, PA.—Articles of incorporaiton will be applied for by the Glen Rock-New Freedom Telephone & Telegraph Company. The company is composed of the following: Charles A. Beck, S. R. Brodbeck, Brodbeck; Joseph Dise, H. H. Freed, New Freedom; Maurice Spector, New Freedom, and Elf Sterner, Jef-

WINDSOR, PA. (Castle Parks county)—A new company recently incorporated at this place, with a capital stock of $5,000, is the Windsor Rural Telephone and Telegraph Company.

ELBRIDGE, TENN.—The Elbridge Telephone Company was recently incorporated by S. E. Carpenter, H. K. Huey, J. J. Puckett and others.

YORKTOWN, TEX.—The Clear Creek Telephone Company is the name of a new telephone company recently incorporated by M. Cellain, Carl and Frank Gaida and others.

POUND, VA.—The Pound Telephone Company, recently organized here by G. Swindall and others, for the purpose of building local, independent telephone lines from Pound, via Freeling and Almira to Clintwood, Va., 15 miles, makes the announcement that it will construct lines to Dewey and Flat Gap, 12 miles. A franchise is being secured. G. Swindall is manager of the company.

FINANCIAL.

SANDWICH, ILL.—The United Telephone Company has increased its capital stock from $700 to $1,000.

OMAHA, NEBR.—The Burt County Telephone Company has made application to issue $75,000 in stock. This company was recently organized to take over the plants at Oakland, Lyons and Decatur.

HARRISBURG, PA.—The Orbisonia Telephone Company, of Huntington county, filed with the recorder an increase in capital stock of $40,000. The capital stock having been $10,000, the company now is capitalized at $50,000.

CANADIAN, TEX.—The Canadian Long Distance Telephone Company recently amended its articles of incorporation increasing the capital stock from $20,000 to $40,000.

FRANCHISE.

CHICAGO, ILL.—Girard A. Ellingson, an attorney in Chicago, has applied to the board of supervisors of Lake county for a franchise to erect poles and install a telephone system in Lake county and Waukegan. His plan is to serve the farmers in that section.

ROCHESTER, MINN.—The Rochester Telephone Company, represented by J. A. Melone, has applied to the city council for a new franchise. The franchise under which the company now operates has but five years more to run, and Mr. Melone stated that as the company is desirous of securing funds and doing a large amount of extending and improving to its system, it first wished to secure a new franchise, as the company hardly cared to do the amount of work it would do if the franchise were allowed to run out in five years.

CLARKSBURG, W. VA.—The Consolidated Telephone Company of Fairmont has been granted a thirty year franchise by the city council. The city reserves the right to take matters in hand should the rates of the company become too high, or in the question of a sale of the properties to another company. The Consolidated company will at once begin the construction of a new and thoroughly up-to-date system in the city. Underground cables will be installed, and modern equipment of every kind used.

CONSTRUCTION.

LOS ANGELES, CAL.—The Home Telephone & Telegraph Company is installing a private branch exchange switchboard, and one for general line use in its main office. The capacity of the cable system in the downtown district is also being doubled, and preparations for the installation of four new branches are being made. It is estimated that the extensions will cost about $350,000.

FT. WAYNE, IND.—Wm. L. Mollering, secretary-treasurer and general manager of the Home Telephone Company, announces the completion of a new No. 10 copper circuit to Huntington.

BARBOURVILLE, KY.—The Knox County Home Telephone Company will commence almost immediately the construction of local telephone lines. It is probable that the lines will extend from Barbourville to Artemus, and from Barbourville to Gray—a distance of about 20 miles. The city lines will be entirely overhauled and partially rebuilt. W. E. Walters is manager of this company.

BOONEVILLE, KY.—Right-of-way is being secured by the Booneville Telephone Company for the construction of a local line from Booneville to Sturgeon, Ky., a distance of 24 miles. This line will take in the towns of Iredell and Preston.

HAZARD, KY.—The Perry County Telephone Company will purchase a new switchboard and make other improvements in its system. Besides it announces that a local, independent line will be built from Hazard, via Dwarf, to Chavies, 16 miles, where connection will be made with the Hyden Telephone Company's lines. Right-of-way has been secured. D. Y. Combs is manager of the company.

HINDMAN, KY.—The Knott County Telephone Company will install a new switchboard to facilitate its rapidly increasing business. It will also build and repair its lines in and around Hindman, besides constructing a new line from Hindman via Hippo, Dema and Dwale, to Prestonsburg, Ky., 30 miles. Construction material will be needed. Address S. R. Stacy, manager.

INEZ, KY.—The recently organized Inez Telephone Company will begin the construction of a system in and about the town. One line will be extended from Inez to Warfield, where long distance connections will be made. F. A. Kirk of Inez is manager of this company.

JEREMIAH, KY.—The Lower Rockhouse Telephone Company will install a new switch at Jeremiah, and do considerable repairing on its lines. A new line will be extended to Isom, Ky., 10 miles. Line material will be needed. J. M. Brown is manager of the company.

MAYKING, KY.—The Mayking Telephone Company will make extensions and build new lines at an early date. A new line will be built from Mayking via Bilvia and Tonny to Wright, Ky. Construction material will be needed.

PIKEVILLE, KY.—The Eastern Kentucky Home Telephone Company is making arrangements to build about 5 miles of line—an extension to its Pikeville-Baker line, via Chip to Craftsville, Ky. At this point connection will be made with the Letcher County Home Telephone Company's lines. N. Starkey is manager of this company.

SERGENT, KY.—The Letcher County Home Telephone Company is securing a franchise for a local, independent line from Sergent, via Craftsville, Vilas, Wright and Pound Gap, to Pound, Va., 15 miles, construction of which is to be begun at once. W. B. Webb is manager of the company.

QUINCY, LA.—The Commercial Club held a meeting a short time ago to discuss the establishment of a local telephone system. The members, it is reported, were very enthusiastic and $500 were subscribed toward such an establishment.

JACKSON, MISS.—Announcement has been made that the long-distance lines of the Home Telephone Company from Meridian and Hattiesburg into Jackson will be completed by the middle of January, and service instituted at once. A franchise has been applied for by the company to install a system in Natchez, and long-distance lines will be built to Natchez.

RAVENA, N. Y.—A new telephone line is being run two miles north from the village by the Ravena and Medway Telephone Company.

RALEIGH, N. C.—The Home Telephone Company, of which F. C. Toepleman is manager, reports considerable improvements and extensions for the new year. It is said that long-distance lines will be extended from Newberne to Jacksonville; Bunn to Weldon, and Greenville to Washington. These extensions take in many of the towns along the right of way.

BALLINGER, TEX.—The West Texas Telephone Company, as reported by W. B. Stromeyer, general manager of the company, with headquarters in Brownwood, has announced that at the beginning of the new year construction, improvements and extensions will be commenced which will cost in the neighborhood of $20,000.

BELLINGHAM, WASH.—Stockholders of the Farmers' Mutual Telephone Company are planning to double the service of their system, and for this purpose all stockholders and farmers connected with the system have been assessed a certain amount to pay for the improvements.

WENATCHEE, WASH.—The Farmers' Telephone Company have completed arrangements for the extension of a line across the river into east Wenatchee. Improvements have been made in this company's system along the upper part of Wenatchee, and the lines will now be extended north and south. An exchange was recently installed at Peshastin and during one week, 35 telephones were installed.

BLEINHEIM, CAN.—The Wheatley Telephone Company, Ltd., and the Bleinheim & South Kent Telephone Company have constructed long-distance lines from Blenheim to Wheatley. Connection is made through this with over 700 subscribers.

ELECTIONS.

LONG POINT, ILL.—The Citizens Telephone Company met and elected the following officers: President, S. L. Reeder; vice president, R. L. Swearingen; treasurer, R. Little; secretary, R. L. Swearingen.

LUDLOW, ILL.—The Harwood Telephone Company elected the following directors: George Watson, Chas. E. Arnold, Joseph Pearson, J. F. Kirk and D. H. Clandon.

WORDEN, ILL.—The annual meeting of the Worden Telephone Company was held recently and J. A. Stice, A. Z. Rice, F. W. Stoecker, C. W. Wall and S. P. Williamson were elected directors.

ROCKVILLE, IND.—At the annual meeting of the Marshall Citizens' Telephone Company, Wilson W. Cummings was elected a member of the board of directors. This company is in very good condition. When the company was organized about five years ago it had an indebtedness of over $1,000. The debt has been paid off and the company has a surplus of $500.

ALBERT CITY, IA.—The Albert City Telephone Company held its annual meeting a short time and elected officers. C. Y. Young was elected manager. Officers are: President, Dr. B. B. Bridge; vice-president, E. Carlson; treasurer, A. T. Kindwall; secretary, C. A. Miller.

BANFIELD, MICH.—The stockholders of the Banfield Telephone Company met recently and elected the following officers: Dr. O. R. Cooper, president; C. H. Palmatier, vice-president; D. C. Stiles, secretary; A. M. Edmunds, treasurer, and Geo. Winters, manager. Reports showed the company to be in good condition, and the growth in telephones for the year quite satisfactory.

BREAK O'DAY, MICH.—The People's Mutual Telephone Company held its annual meeting and the reports showed the company to be in good condition. L. B. Smith was re-elected president of the company; Fred Miller, secretary; Fred Holland, vice-president, and F. C. Risch, treasurer. Will Eckhart, Herbert Briggs and Elmer W. Monroe are the directors.

NATHAN, MICH.—The annual meeting of the Daggett, Nathan & Faithorn Telephone Company was held recently. A dividend of 10 per cent was declared on all the old stock and of 7 per cent on the new. The report showed a surplus of over $900 after all expenditures had been made. The following directors and officers were elected: President, Paul Perrizo; vice-president, Clarence Harter; treasurer, Dr. Landsborrough, and secretary, C. W. Wilkins. Directors are: Paul Perrizo, Dr. Landsborrough, Eugene Houte, C. W. Wilkins and Clarence Harter.

LIME SPRINGS, MINN.—Officers elected by the directors of the Lime Springs & Cherry Grove Telephone Company are: D. J. Nagel, president; H. Parchman, vice-president; Fred Hill, treasurer, and A. Arneson, secretary.

RAMEY, MINN.—The Morrill Telephone Company elected the following officers for the ensuing year: J. M. Thoen, president; Clyde Young, vice-president; Bert Cheeley, secretary, and H. J. Schwartz, treasurer.

RED WING, MINN.—D. M. Neill was elected president; C. A. Rasmussen, vice-president; V. S. Neil, secretary, and W. C. Krise, H. E. Akenson, R. L. Grondahl, A. G. Sherf, E. H. Moulton and N. H. Featherstone, directors of the Red Wing Telephone Company.

WESTERN, MINN. (R. F. D. FROM CAMPBELL).—The directors of the Western Co-operative Telephone Company have elected the following officers: W. S. Tooms, president; Owen Sholburg, vice-president; C. A. Fablan, treasurer, and E. P. Barsby, secretary.

FARMINGTON, MO.—Stockholders of the Farmington Telephone Company met and elected directors as follows: T. H. Stam, J. W. Buck, S. O. Tetley, J. H. Tetley, J. W. and E. T. Karsch.

ROCK PORT, MO.—The annual election of the Rock Port Mutual Telephone Company resulted in the choosing of the following directors: J. M. Sliger, F. H. Schooler and Geo. H. Sly.

BLAIR, NEB.—At the annual meeting of the stockholders of the Arlington Independent Telephone Company the following officers were elected: President, Fred Echtenkamp; vice-president, G. I. Pfeiffer; secretary, A. G. Ludwig, and H. W. Marshall, treasurer.

PAPILLION, NEB.—At a recent meeting of the stockholders of the Home Telephone Company, Fred Trumble, C. S. West, C. W. Shobert, Mike Hughes and I. D. Clark were elected directors.

SPENCERPORT, N. Y.—The annual meeting of the Ogden Telephone Company was held recently. Two directors, L. W. Adams and Joseph V. Rogers, were elected. An auditing committee of James T. Truesdale, H. J. Rich and E. J. Adams were elected.

DAYTON, ORE.—The annual meeting of the Yamhill County Mutual Telephone Company was held recently and the following officers elected: J. C. Nichols, president; J. W. Martin, vice-president; W. T. I. Tucker, secretary. The company is made up of 225 members.

SHORTLESVILLE, PA.—Following is a list of the officers elected by the newly formed Shortlesville Rural Telephone Company: President, O. F. Berger; vice president, J. W. Albright; secretary, Jas. C. Berger, and treasurer, A. J. Hoag.

VOLANT, PA.—At the annual meeting of the Plain Grove Telephone Company the following directors were elected: C. H. Turner, M. A. Offutt, Wm. McCune, Sylvester Rogers, Winfield Rogers and H. M. Moore.

FLANDREAU, S. D.—The Rural Reciprocal Telephone Company recently elected the following officers: William Dailey, president; J. K. Duncan, vice-president, and H. A. Booth, treasurer.

WATERVILLE, WASH.—At the annual meeting of the Farmers' Independent Telephone Company the officers elected for the ensuing year are as follows: J. C. Brenneschotze, president; M. M. Kuden, vice-president; W. E. Gaskill, secretary, and J. E. Leslie, treasurer.

HARRISVILLE, W. VA.—The stockholders of the Progressive Telephone Company have elected the following officers and directors for the ensuing year: Alfera Goff, L. Morris Law, J. W. Goff, Asa Hardman and H. G. Law. Alfera Goff, president; John A. Hall, vice-president; J. W. Goff, secretary; H. G. Law, treasurer, and H. H. Goff, general manager.

DEER PARK, WIS.—The Deer Park Telephone Company at its annual meeting elected the following officers: President, J. Y. Thompson; secretary, Ed. Hanson; treasurer, H. C. Christopherson. The company is in excellent financial condition and next spring a number of new lines will be constructed.

HAMMOND, WIS.—Officers were elected as follows, at the annual meeting of the Hammond Telephone Company: President, George M. Leonard; vice president, P. McLaughlin; treasurer, L. J. Webster; secretary-manager, Andrew Hope. Directors are George Knipfel, T. Keating, P. Casey, Wm. Jost, P. McLaughlin, C. Hanson, and L. J. Webster.

LIVINGSTON, WIS.—The Grant County Telephone Company held its annual meeting recently, and as a result of the election held the following have been named directors: J. H. Hartsook, Ed. Edgington, David Livingston, Pierce Nicholsin.

MISCELLANEOUS.

WASHINGTON, D. C.—The following appears in the Daily Consular and Trade Reports of December 22: "An American consular officer in Russia has forwarded opportunities for the extension of American trade in that country. He requests that replies be sent to his office." Further details may be received by applying to the Bureau of Manufacturers, applying to file number No. 121—Conduits.

MONMOUTH, ILL.—The Monmouth Telephone Company suffered a great deal of damage in the recent sleet and snowstorms. Many of the company's wires were torn down and some poles broken. However, the company was prompt in making repairs.

TAMPICO, ILL.—John H. Daley has leased the telephones of the Tampico Farmers' Company.

CONRAD, IA.—The local telephone system was badly damaged in a recent electrical storm, about 400 poles being torn down and the damage amounting to about $1,400.

ANTIOCH, KY.—In a letter to TELEPHONY, Messrs. Sweazy Brothers of this place report that this town is not supplied with telephone service of any kind, but that the people would be glad to have same, the nearest line being four miles away.

MUSKEGON, MICH.—The Citizens' Telephone Company has asked the city council for a thirty year franchise to construct and operate a telephone system in the city. To secure this franchise it is necessary to hold a special election and secure a three-fifths vote of the electors of the city, after which the franchise may be granted by the council.

FERGUS FALLS, MINN.—Since the telephone company now operating in Fergus Falls has been proposing to install a new exchange and raise the rates to subscribers, local business men have applied to the city council for a franchise and will organize a local telephone company.

GREENWOOD, NEB.—The Independent Telephone Company suffered great damages to its system by reason of the heavy sleet storm in that section. Mr. Pollock of that company estimates the damage to be fully $12,000 in Cass County, and that possibly the damage to the system will run as high as $20,000. The company is working vigorously reconstructing the lines.

NEW YORK CITY, N. Y.—A new company recently given articles of incorporation is the Telephone Subscribers' Protective Association. Its object is mainly to protect its members from overcharges by telephone companies. The association purposes establishing a system of audit of accounts between telephone companies and the subscribers. A bureau of information will be also established for the members. The directors of the new association are: Harry B. Platt, I. S. Lembert and David Prayer.

COLUMBUS, O.—M. Leon Fonfreds, one of the leading electrical experts of Paris, France, who was sent out by the French government to inspect the telephone systems in the United States with a view of instituting reforms in the system in France, visited the plant of the Columbus Citizens' Telephone Company recently. He made a close inspection of the system in vogue in Columbus and paid high compliments to the efficiency of the system and the management. He was accompanied by M. Lecocq, who acted as interpreter and who is also an electrical engineer of note.

LIMA, O.—It is reported that a deal has been consummated whereby control of the Delphos Home Telephone Company is taken by the Lima Telephone Company.

GUTHRIE, OKLA.—George Player, telephone expert of the telephone corporation filed complaints with the commission against eleven telephone companies of the state for alleged contempt of an order requiring full reports to be submitted. The cases are to be heard January 11. The telephone companies cited are: The Quahan & Mangum Telephone Company of Altus, the Chickasha of Ardmore, Custer City of Custer City, Billings & Red Rock of Billings, Farmers' Mutual of Weatherford, Hastings of Hastings, Jennings of Jennings, Leger & Chickasha of Altus, Kingfisher of Kingfisher, Delaware of Nowata, and Marshall of Marshall.

WESLEY, PA.—The Venango Telephone Company, of Westley, Venango County, Pa., held its annual meeting recently. The company signed a contract continuing their connection for two years with the Petroleum Telephone Company of Oil City, one of the most important Independent plants of Western Pennsylvania.

DORCHESTER, WIS.—The Midway Telephone Company is having considerable trouble in extending its line into the town of Holton, one mile south of Dorchester. It is expected that the work will soon be allowed to go on without any further trouble.

GREEN BAY, WIS.—The Fox River Valley Telephone Company issued a short time ago a new directory for its telephone patrons. This directory shows a very substantial growth since the last issue in May. The company gives service directly to over 2,000 subscribers.

MADISON, WIS.—The town of New Richmond is said to be having trouble with the Wisconsin Telephone Company in the matter of free service for the municipal offices. The town has an agreement with the telephone company similar to that which the city of Superior made with the Douglas Telephone Company. Under the ruling of the state supreme court, if such agreements were made before the passage of the public utilities law, they are valid and cannot be disregarded. The Wisconsin Telephone Company has been sending in bills monthly to the town for service, which it refuses to pay. No action has been taken as yet.